American FORESTS

MAY 1934

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CONTENTS FOR MAY, 1934

Vol. 40 ◆ ◆ ◆ No. 5

THE COVER
"THE BIRCHES"
Photograph by N. N. NADEAU
Exhibited in Contest for "Most Beautiful Photographs of Trees in America."

TO ARMS FOR THE AMERICAN ELM
By JOSEPH EDGAR CHAMBERLIN 195

MAKING WATER WALK IN THE TENNESSEE VALLEY
By GUS LENTZ 200

A FOREST CREDIT SYSTEM
By BURT P. KIRKLAND 203

WHERE THERE'S A WELL
By GILBERT STEWART 205

HEPATICA—MY GEM OF PEACE
By MARY LOUISA HELLINGS 208

BABY STYLES IN BIRDLAND
By IRA N. GABRIELSON 209

"MOUNTAIN HEMLOCKS"
Prize Winning Photograph by RAY ATKESON 212

EDITORIAL—
Saving the American Elm 213

THE LUMBER INDUSTRY EMBARKS UPON FORESTRY 214

FROM THE DIARY OF A TRAIL RIDER
By CARMEN HAIDER 215

FIELD AND FOREST FOR BOYS AND GIRLS
The Courtship and Nesting of Birds
By JOHN HARVEY FURBAY 216

FAMOUS TREES EVERY BOY AND GIRL SHOULD KNOW—
No. 13—The "Battle Ground Oak" at Guilford Court House 217

"WHAT THE C.C.C. HAS DONE FOR ME"
'I Have Learned to Know the Human Race'
By HAROLD H. BUCKLES 218

AROUND THE STATES 220

WALLACE MOVES TO PROTECT GAME ON THE NATIONAL FORESTS 220

THE CONSERVATION CALENDAR IN CONGRESS 226

FORESTRY IN CONGRESS
By G. H. COLLINGWOOD 228

"WHO'S WHO" AMONG OUR AUTHORS 240

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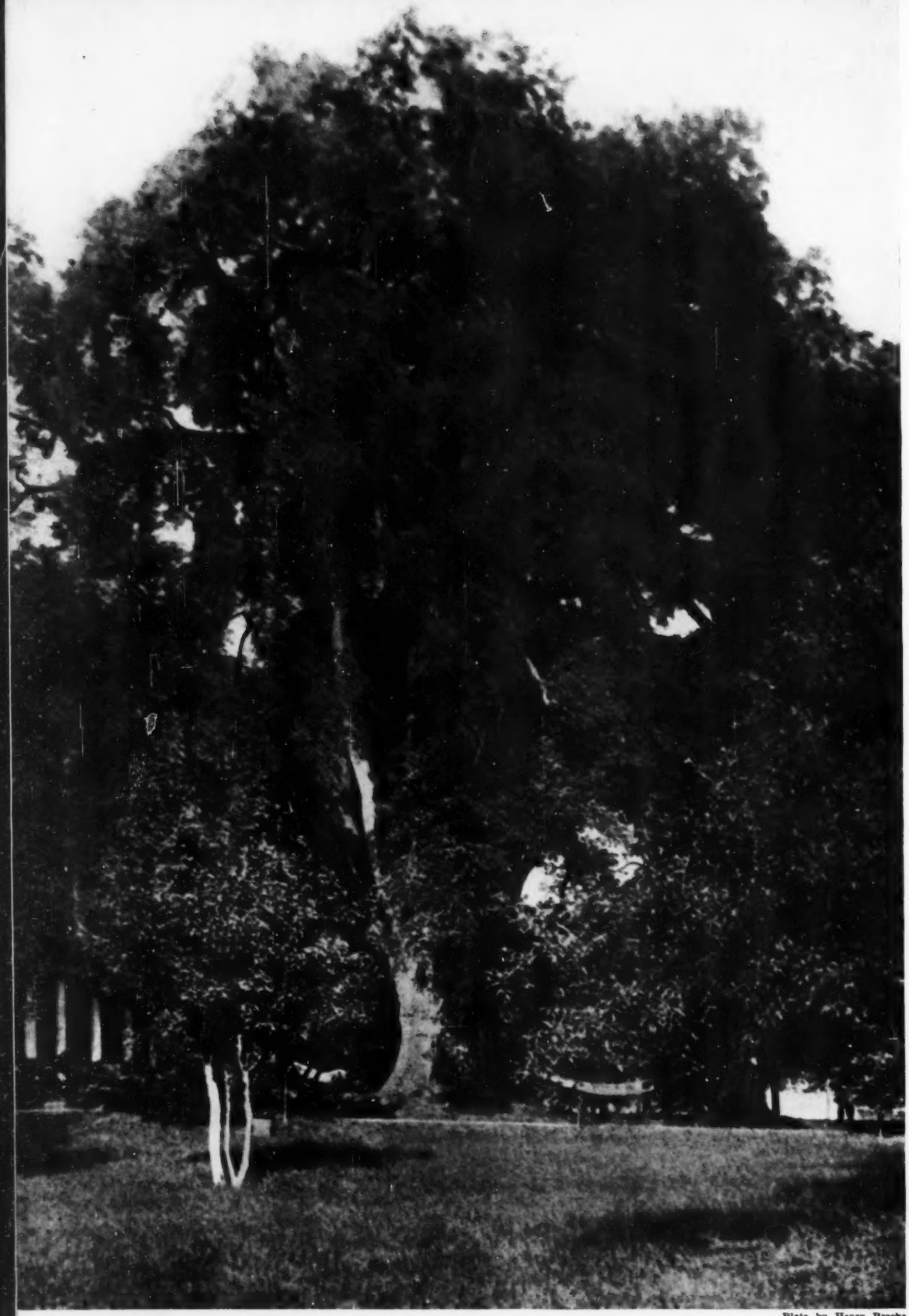


Plate by Henry Brooks

As Washington towered above his fellows, so does the Dexter Elm, at Malden, Massachusetts, rise in majesty—the most beautiful of all trees that ever sprang from American soil, in the opinion of the author. Such an elm might have inspired the poetical words of Walt Whitman: "Why are there trees I never walk under but large and melodious thoughts descend upon me?"

TO ARMS FOR THE AMERICAN ELM

By JOSEPH EDGAR CHAMBERLIN

(Illustrated with plates from "Typical Elms and Other Trees of Massachusetts" by Lorin L. Dame and Henry Brooks, Boston, 1890)

WE DO not have in America "sacred trees" as they have them in China or India or as the ancients had them, but if one were to name a tree sacred to all our people it would be the American elm. Since the Pilgrims first landed it has hailed us joyously from the woods and the meadows; it has sheltered our homes; it has played with our children. By its friendliness, its virtuous beauty, its unfailing sympathy, the American elm has become enshrined in the very souls of our people and in the history of our country.

Of all our trees worth fighting for, the elm comes first. Even the soil in which it has sunk its roots is sacred earth to millions of men and women, boys and girls. America fought a good fight to save the chestnut—and lost. An invader from foreign climes—the chestnut blight—wiped it from most of our landscape. We began that fight too late. Now another invader from foreign lands—the Dutch elm disease—has recently reached our shores. It has been uncovered in New Jersey, New York, Maryland, Connecticut and even Ohio. Incipient and scattered though its attack is, the disease potentially is as destructive to the elm as the blight was to the chestnut. Its invasion must be stopped promptly and while it is possible to stop it or the American elm will go the way of the American chestnut, and in its place will stand merely withered and rotting forms as monuments to its hallowed memory.

To arms, therefore, for the American elm!

Let us mark well its character that our vigilance and de-

Photograph by James A. G. Davey

Old elms at Deerfield, Massachusetts. Of all our trees worth fighting for, the American elm comes first. Its splendor of form has made it the pride of whole communities and being a "home tree" it has been planted at countless doorways throughout the land where its friendly and sheltering branches spread above little children who ever since the Pilgrims landed have played about its feet and climbed aloft into its sturdy limbs.

Plate by Henry Brooks

Taken as a group, the elms of old New England are the most characterful of all American trees—their lives are woven into our earliest history. The Pilgrims sought out these trees near which to build their homes, for the elms seemed to say: "We are a villageous tree. We are to serve and comfort people." The Old Elm at Rocky Nook, near Hingham, Massachusetts, transplanted by Stephen Cushing to its present position in 1729.

fense in its behalf may be worthy of its sacred service. It was one of the first trees to attract the eyes of the original European settlers on our shores. It welcomed them from the woods, from the river meadows and from the open spaces. They planted it to commemorate their arrival in a new land, their migrations, their marriages, the births of their children. And it grew in luxurious sympathy and significance with their lives and became associated with the history of each family.

Its surpassing splendor of form made it the pride of each community. Its gentleness aroused the affection of the children who clustered at its feet. For them it was a climbable tree—not when it stood tall, single and columnar, but, as it often did, when it parted near to the ground into two stems, to the rough and corky bark of which bare feet could easily cling until the lowest big branches were reached; and from these one could travel all over the tree, explore bird-nests, play games and test the venturesome spirit of youth. Children and tree grew together. No wonder it gradually assumed a well-nigh sacred character.

When the Pilgrims landed on Plymouth Rock and Winthrop's men came ashore at Salem, and presently walked inland a little to see what the country was like, they looked off over shaggy wilderness and saw, here and there across the wild, the tops of certain trees rising above the rest. Those trees had spreading tops, sometimes flat, sometimes rounded into a dome, but always with a sort of brooding, protecting aspect, as if they were warming somebody when it was cold and cooling them when it was hot. They looked as if they had grown as they were to shelter and to decorate somebody's home. They seemed to say from the start, "We are a villageous tree. We are to serve and comfort people." The settlers went straight and sought these trees out. And wherever they found red men and women dwelling in huts of bark or tents of skin there was likely to be growing nearby an elm tree. If no men at all were there, trees of this sort stood out in open spaces or in river meadows as if they were waiting there till men should come.

When the newcomers examined the bark and the leaves of these trees they exclaimed all together, "Elms!" They were right. The trees were of the familiar kind they had left home in England, and had found so useful there. Elms! Their wood had the same toughness, the same flexibility, the same close-grained, unknotted quality; the tree had the same serrate leaves and quite similar purplish-brown tufts of flowers in spring. Yes, it was an elm, but how changed and glorified in form—infinitely more majestic and graceful in growth, vase-like, lofty, commanding, spreading widely forth at the top, as if extending a benediction over the meadows or the woods in which it grew, as if inviting the newcomers to come and dwell beneath it!

It is hard to tell whether the Pilgrims immediately took the American elm into their lives or whether the elms took the Pilgrims into theirs. When the Pilgrims, their feet once on the firm ground, walked abroad in the new land they had resolved to make their own, they had a two-fold feeling about this tree—it was the elm, their own elm, and yet it was a new and finer tree; a familiar friend, and yet a revelation of the new world. They proceeded to make the identical use of its wood that they had made of its English brother. Beginning as an old friend, it soon became a grand new friend. Like the English elm, it represented civilization and progress, for its wood was particularly adapted to the making of wagons, the knowledge and use of which marked the difference between savage and primitive life and civilized existence. Besides wagons, it furnished the keels and other makings of boats, in which people, foodstuffs and all merchandise were transported on the streams and along the sea-coast. The settlement and civilization of the country would have been much slower without the providential presence of the elm in the new land.

Though the pious Pilgrims must have recognized the hand of Providence in the abundance and superiority of the American elm, it may well have been the beauty of the tree that first induced the newcomers to dig it up in the woods and transplant it to their homes. The old records show that they planted handsome young elms from the woods or

the meadows at their doors to grow and to serve as memorials of their first marriages or of the birth of their children. It became the new country's monument tree, for which purpose, it seemed, the Almighty had shaped it. As the settlers increased and spread to the westward and northward, they found the tree growing naturally and in greater abundance. They found the Connecticut Valley a veritable nursery and Paradise of elms, and they planted towns there in the shade of the elm fathers. They and their children found it not only throughout New England, but in New York, and in Pennsylvania, where William Penn, at the head of another company of English pilgrims, made with the Indians a beneficient treaty under an elm which remained as a monument of the event for centuries. Colonists penetrating farther and farther west found it and before many years it was proven indigenous to the whole country east of the Great Plains. But it had no liking for the arid lands.

The elm tree has not changed its habits since the days of settlement. It has never formed great forests by itself, though it has covered considerable tracts, and in several states it has furnished, and still furnishes, large quantities of timber for export to other states or to foreign countries. It has always occupied a high place in public sentiment, because always its ways have been ways of pleasantness and its paths the paths of peace. One of the most self-supporting of trees, it needs little care, often thriving without any care at all. It has favored the meadows, the door-yards and the roadsides. Its likings are domestic. All its suggestions are happy.

When you are in your bed in the dead of winter, to think of the elm is to dream of the summer. You see it dappling the pasture with broad and slowly-moving spots of shade, and seeming to arrange these spots so that the cows and sheep come into them, and so that the boy on the bank of the river, fishing, sits in one of them. You see the elm holding its restful shadow over the tired housewife as she seeks refuge from the hot kitchen on her doorstep. You see the row of elms along the village street spreading a beneficent parasol over the whole village. Even if outside the town only a lonely landscape of scraggly woods meets the eye, there are in it single elms or clusters

In point of size and pure grandeur, the palm is yielded to the tree known as "the Big Elm of Lancaster" which as long as it stood was known as the greatest elm in all New England. In 1890 its height was ninety-five feet; its girth twenty-four feet and its spread of branches 114 feet.

Plates by Henry Brooks

This venerable tree citizen is the "Pratt Elm," perhaps better known as the "Great Elm at Concord," and is believed to have been set out in 1700. Loved of Emerson, Hawthorne and Thoreau, it is of the "oak type"—its beautiful stem rising, like the pipes of a great organ, to be played upon by the winds of heaven.

of them which tell a comforting little story of their own. It suggests that if the oak was sent to the earth for strength, the elm was sent for shade and grace and cheer and beauty. Finding its sustenance where it sprouted and grew, it sends its seeds far and wide. Like the citizen, it aspires to the greatest heights, and has the widest outlook. It struggles determinedly against enemies and disadvantages.

The elm tree does not like drought any more than human beings do, but it will stand a lot of it, and in this characteristic arises the need for the American citizen and the American elm to collaborate if they wish to keep on living together in the successful amity which has marked their three centuries together. The big elm at your door is a thirsty being. For its health and vigor it needs, we are told, thirty barrels of water every day! If it does not get it in its immediate vicinity as a free gift from heaven, it seeks it by sending its wonderful rootlets long distances. These little rootlets, growing out of the larger roots, permeate the ground all roundabout. They suck moisture from the soil wherever they can find it. They are not at all considerate of what the apple tree, and the plum or the peach, or the rose bushes may regard as their prior right to the soil. The elm rootlets pass under the house you live in; under the concreted floor of your cellar, and come up in the garden on the other side, and every drop of water they can find they take. For this, nature's great design constituted them. Sometimes this means devastation for the garden, and fatal thirst for the rose bushes and the plum and the peach. But your faithful elm, your beautiful and cheering and beloved elm, must drink to live. Its straight and noble form, its vase-like spread that so delights your eye, its great bulk and height that make it a monument in your life, your memory, your character, have been created and nourished by the abundant water which it is able to draw from near and far.

This water you have been taking away from it with your increasing cultivation of the ground, your garden crowded with plants, your numerous shrubs filling your yard, your heavy and sapping lawn. Our recent changes in the way of life, our intensive cultivation, have been robbing the door-yard and street elm of its supply of water in the soil, often weakening its constitution and making it more susceptible to disease—the Dutch elm disease. This robbery must be supplied, if necessary from your domestic supply. Even the household well, from which the elm tree used to pilfer a few drops, is gone. The tree will expect at least as many drops from your taps.

Photograph by James A. G. Davey

When Winthrop's men came ashore at Salem, they saw across the shaggy wilderness certain trees rising above the rest. So stood the elms then, in open spaces or in river meadows, as if waiting for the coming of the white man. So stand they now—majestic, vase-like and graceful—spreading their green canopy of shade—a benediction to the land and its people.

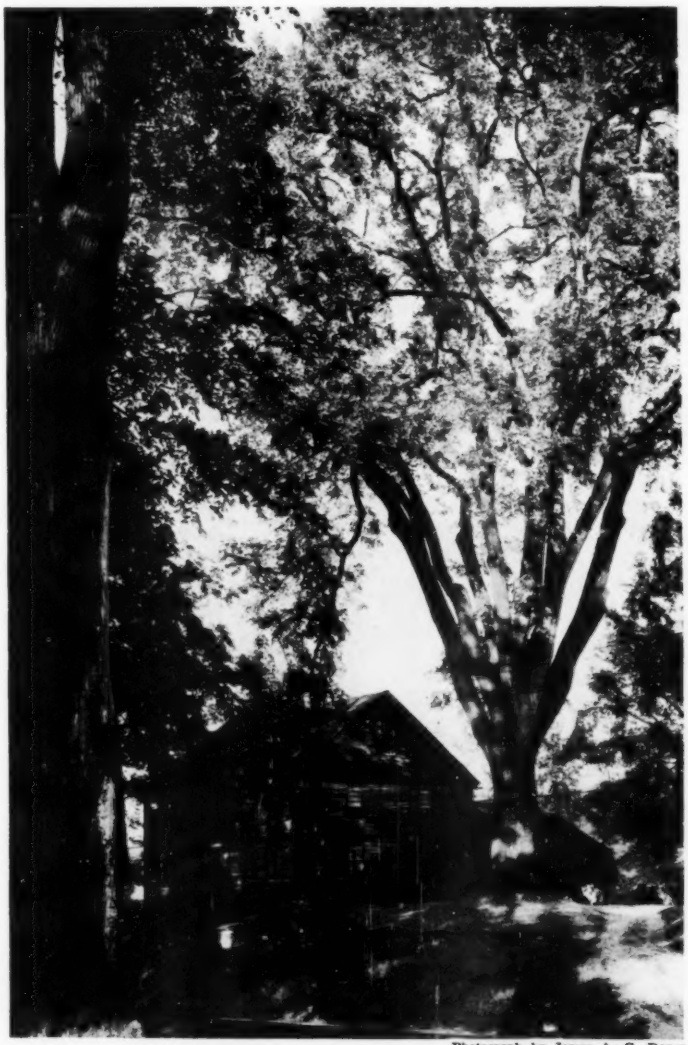
It was natural that the first American elms to find a place in the records of science, and to achieve mention in history and literature, should have been those of New England. The same trees earliest attracted the attention of the European botanists who were the first to study the vegetation of our continent. Michaux, the French botanist and traveler, who wrote the first authoritative book on "The Trees of North America," pronounced the American elm "the most magnificent vegetable of the temperate zones." Michaux must have seen the elms which still survived in New England at the beginning of the Nineteenth Century, and which had attained fame by that time either on account of their size and splendor or by association with events. He may have stood under the "big elm" on Boston Common which, according to the traditions of the people of that town, had been spared by the founders when they swept away the forest that occupied the site. This "Boston Elm" stood alone near the center of the Common "in a rich hollow" and near enough to the natural pond called the Frog Pond so that the tree's roots could derive from that small but perennial source a sufficient supply of water.

It was a handsome tree and much loved by the citizens. The tree had certainly stood there throughout the Eighteenth Century and part of the Seventeenth. It was over-

thrown by a great gale on the fifteenth of February, 1876. In 1825 its height was sixty-five feet, its girth at two and a half feet from the ground was twenty-one feet, eight inches and its spread eighty-six feet. In 1855 its height was seventy-two and a half feet. When it finally fell its largest branch was sawed off and its growth-rings counted; they numbered 199. If this represented the age of the tree, it could not be assumed that it had been standing when the town was settled, because 246 years had elapsed. It may have dated from 1640 or 1650. It was already known as the "old elm" or the "great elm" when the Nineteenth Century dawned, although both these terms were sometimes applied to the "Liberty Tree," which stood on Washington, the principal street, near the south end of the town, under which the fomenters of the Revolution met, and which was cut down for fuel by the British, who left behind them no record of it except to say that they got fourteen cords of wood out of it.

A more famous tree than the Great Elm of Boston Common and also one whose early history is better attested, was the Washington Elm, on the edge of the Common at Cambridge. This tree, probably the most famous of American elms, was undoubtedly of the original forest growth. It was in its maximum glory when the American Revolutionary Army assembled at Cambridge, in 1775, and it was under its spreading branches that Washington took command of the army on July third of that year. On the spot on the street opposite the tree, where afterward a stone church was erected, then stood the residence of the Moore family. The whole ceremony was witnessed by the members of this family. A daughter of the family, who saw the whole scene, lived in good health for seventy-five years after, and pointed out the tree quite positively in 1848. The statements of other eye-witnesses have left no doubt of the circumstances. The tree itself stood in fairly good condition until quite lately. The writer saw assembled in its shade soldiers of the World War. who were quartered in barracks erected on the adjoining Common.

Never were there nobler elms than those of early origin of spontaneous growth in the Connecticut valley; and of those which stood until a recent date in Springfield and Deerfield, Massachusetts, and at other places northward to the upper river in Vermont and New Hampshire the writer has many recollections. So has he of the "Pratt Elm" known as the "Great Elm at Concord," loved of Emerson, Hawthorne and Thoreau; this tree is believed to have been set out in 1700. The last time the writer was at Hingham, Massachusetts, the Old Elm at Rocky Nook, known to have been transplanted to its present position by Stephen Cushing in 1729, and one of the most shapely and luxuriant elms in New England, was still standing in perfection.



Photograph by James A. G. Davey

The elm is a domestic tree—all its suggestions are happy. Here it stands—a guard of beauty—dappling the old place with its kindly shade. Think what a national catastrophe the loss of our elms would be, and take up arms in support of the warfare against the destroying Dutch Elm disease.

The writer knew well the elm which he regards as the most beautiful of all the trees that ever sprang from American ground, the Dexter Elm at Malden, Massachusetts—a tree whose majesty among trees was that of Washington among men. This was the tree which Lorin L. Dame and Henry Brooks, in "Typical Elms and Other Trees of Massachusetts," deemed most worthy to be accompanied by Walt Whitman's fine line, "Why are there trees I never walk under but large and melodious thoughts descend upon me?" It certainly must have been an American elm that inspired this thought in the poet's brain. No other tree is so inspiring, or so suggestive of nature's melody. In point of size and pure grandeur all the trees that have been mentioned here yielded to a tree which has simply been known as "the Big Elm of Lancaster," which as long as it stood was the greatest elm in New England. In a northern township of Massachusetts, otherwise famous for its trees, this elm rose in 1890 to a height of ninety-five feet with a girth seven feet from the ground of twenty-four feet, one and a half inches and a spread of 114 feet. At that time and for twenty (*Continuing on page* 230)

MAKING WATER WALK IN THE TENNESSEE VALLEY

(Photographs by the Tennessee Valley Authority)

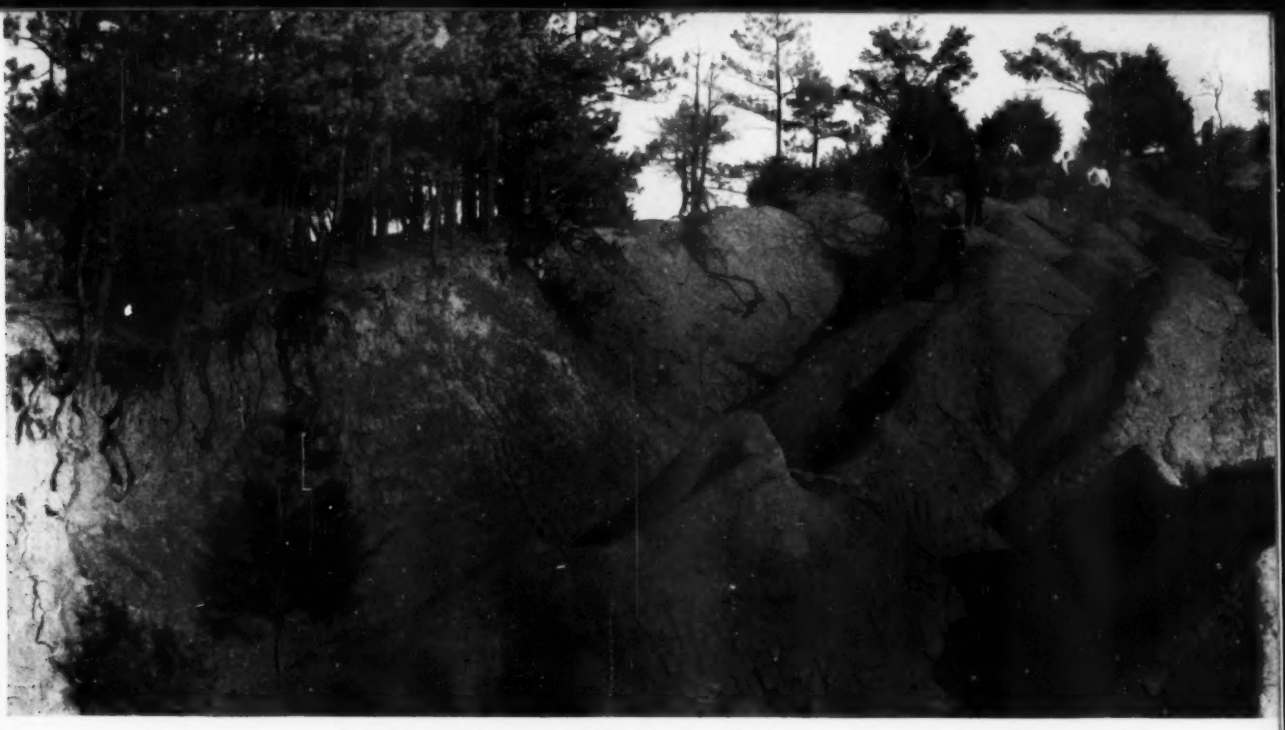
By GUS LENTZ

"YES, sir! Hit used to run off and now hit walks off." This was the comment of an East Tennessee farmer on the effect of soil erosion check dams constructed on his hillside farm to control the run-off of rain water. His is an apt description of what is being accomplished by the twenty Civilian Conservation Corps camps operating in East Tennessee under the direction of foresters and erosion engineers of the Tennessee Valley Authority and the United States Forest Service. The observation is general among the many land owners in the Norris Lake area where erosion by and large was formerly accepted by many as an act of God, concerning which nothing could be done.

Probably the outstanding case of land misuse is that of the farmer who, to save building fences to separate his fields, encouraged the formation of gullies. He plowed double furrows straight up and down the hillside. Within a year or two the resulting gully six to ten feet deep had made a barrier his cattle could not cross. This is an extreme case. There are, however, many areas in the region with slopes up to seventy-five per cent where open cultivation of corn and tobacco is practiced, and where excessive soil erosion is taking place. The steepest slope found planted in corn was checked with an Abney hand level and was found to be eighty-eight per cent. How such slopes can be tilled without danger to life and limb is hard to understand.

"Hit used to run off and now hit walks off," said the East Tennessee farmer, commenting gratefully on the effect of soil erosion check dams on his hillside farm, in controlling the run-off of rain water. Log check dams here control the gully caused by lack of proper road drainage.

The act creating the Emergency Conservation Work and the C.C.C. camps definitely provided that erosion control should be one of their major objectives. In like manner, the Norris Bill providing for the creation of the Tennessee Valley Authority specifically states that one phase of the work in the 25,600,000 acres of the Tennessee Valley should be the erosion and flood control measures



This picture typifies a hill farm completely ruined by erosion. All the top soil has been lost and the remaining material is flaky shale, on which even scrub pine has a hard time existing. There are many areas in the region with seventy-five per cent slope, where open cultivation of corn and tobacco is practiced, and where excessive erosion is taking place.

which foresters have proved to be efficacious in other regions. Without using vegetative cover on a large scale no lasting control of erosion on the steep slopes can be obtained. Hence the problem is primarily one for the forester with the aid of the agronomists and the agricultural engineers.

The Tennessee Valley project is the most ambitious and intensive attack in the eastern United States on the problem of controlling soil erosion on a large scale. The building of check dams is only the initial step in this control undertaking. Areas already too far gone for reclamation for farming purposes are to be reforested; other areas where sheet erosion is taking place are to be converted into pasture or planted to protective cover crops

C.C.C. boys hard at work making the policy of erosion control an actual fact in the Tennessee Valley. First steps in the building of check dams to catch and hold silt from the eroding areas until a permanent vegetative cover can be established.

such as lespedeza. Erosion control was first inaugurated by the Tennessee Valley Authority in the Norris Lake area because of the seriousness of the problem there and its direct relation to the whole Norris Dam development. With an estimated investment of some $38,000,000 for the construction of the 250 foot Norris Dam on the Clinch River below Cove Creek, the expenditure of considerable time and effort for the protection of this investment is also justified.

Preparatory to planting, cedar brush matting is staked down on the bare, eroded spots. Grass seed, scrub pine and cedar are later to be planted on this area.

The area which drains into Norris Lake is the watershed of the Clinch River and Powell Creek, the latter joining the Clinch River at Agee. This drainage area extends well into southwestern Virginia and is estimated to include 1,856,000 acres of farm and forest land. Erosion control work was inaugurated in the lower 500,000 acres of the watershed lying in East Tennessee on account of its close proximity to the dam, and of the fact that erosion is most active and critical in this portion of the basin. The area is therefore serving as a proving ground for the entire undertaking. The eroded lands above Cumberland Gap on Powell Creek and along the Clinch River into southwest Virginia will be attacked next. It is hoped that more men and camps will be available later so that other drainages can be worked in the future well in advance of the completion of additional dams.

A log check dam with a vegetative cover already established behind it. This is the type of dam built in the shallower gullies by the men put to work by the great land restoration project under way in the Tennessee Valley.

The T.V.A. Division of Forestry and Soil Erosion in planning the control work, is setting up the specifications for the check dams and for the forest plantings. It is also inspecting the work done. This function is similar to that of an architect on a building program. The United States Forest Service is furnishing the camp superintendents and the project foremen, whose services may be likened to those of a contractor who actually handles the men in the field. The men themselves were chosen by the Labor Department and assigned to the Army Fourth Corps area. It is the army officers' responsibility to care for the wants of the men in the camps, to feed and clothe them and to furnish a maximum number of workmen to the Forest Service superintendents each day. Funds to carry on the work are provided through the Emergency Conservation Works appropriation.

In the twenty Tennessee Camps under the T.V.A. there are approximately 4,000 men ranging in age from eighteen to forty-five years. In each camp local men comprise from twenty to forty per cent of the personnel. The balance are men largely from New York and New Jersey. Owing to the fact that most of the C.C.C. enrollees were absolute strangers to the region they and their work were at first viewed with distrust and alarm by these Tennesseans of Anglo-Saxon origin. The whole program was so new and strange to the mountain people that they even misinterpreted the abbreviation C.C.C. One notary in securing contracts for (*Continuing on page* 235)

A FOREST CREDIT SYSTEM

By BURT P. KIRKLAND

This is the second of a series of articles dealing with important phases of the national program of forest land management now before the country. Last month Mr. L. F. Kneipp presented the subject of public forests in relation to planned land use and public welfare.

In this issue Mr. Kirkland, of the Division of Forest Economics, United States Forest Service, discusses an equally important question—the necessity of providing adequate credit agencies to enable forest land owners to embark upon longtime enterprises in growing crops of timber.

Next month, Mr. R. C. Hall, a member of the Forest Taxation Inquiry, will present the subject of forest taxation, explaining why it is a vital problem in the permanent management of forest properties and why its settlement is essential to the successful carrying out of the forest plan. Mr. Hall speaks from five years' specialized study of the subject.—EDITOR

AS called for by article X of the Lumber Code, the recent conferences of the forest industries with public agencies on forest conservation developed a program of action by forest industries to assure leaving forest lands in productive condition following future cuttings. In effect, however, the conference recognized two stages of development. First, that it is within the ability of forest industries as now constituted to provide basic standards of fire protection, preservation of young growth during logging, and provisions for regeneration of forests after cutting. Second, that higher levels of forest practice, including maintenance of sufficient growing stock by conservative partial cuttings and the operation of individual or group enterprises on a sustained yield basis, can be materially facilitated through various measures of public cooperation. Besides the strengthening of measures of forest fire protection, the revision of forest taxation methods, and the restoration to public ownership of forest areas unadapted to private operation or in excess of the present financial ability of forest industries to operate, a system of forest credits was recognized by both public and private agencies as essential. It is the purpose of this article to discuss briefly the importance of a properly designed forest credit system and to contribute to a better understanding of the appropriate organization of such an institution.

The type of institution required is one which will handle finance as a service to industry. There is nothing new in this principle, which has long been used by such smaller institutions as building and loan associations, credit unions, etc. In recent years there has been a rapid development of larger institutions of this type and of cooperation between smaller institutions under supervision of the federal government. The development of large institutions and the cooperation between smaller ones is designed to provide financial strength and to facilitate obtaining lower interest rates through borrowing on a large scale in the cheapest money markets. The Federal Land Banks organized in 1917 have had extended experience in handling agricultural land credits from this point of view. The recently organized home loan banks assist locally organized institutions in home loan finance. Occupying a wider and different field, Federal Reserve Banks assist member banks in providing facilities for business operations, besides performing other functions relating to the banking structure, banking resources, and currency of the United States. The point of view of all such limited-dividend institutions is not only to provide necessary credit to industry but at the same time to prevent excessive expansion of credit and to emphasize methods of reducing debt. These principles are oftentimes in full contrast to the aims and practices of financial institutions organized solely to make the largest possible profits through financial operation.

When debt-making machinery of the last mentioned type over-reaches itself through the creation of debt beyond the ability of industry to pay interest and other financial charges, it brings about loss to investors and contributes to industrial depressions through the stoppage of industry. In order to off-set the losses of such periods, high interest charges are necessary if investors are to be enabled through diversification of their investments to obtain on the average even a relatively low net interest rate. Even the more experienced and diversified lending institutions, such as insurance companies and savings banks, which endeavor to confine their operation to preferred types of loans, are seldom able, over a period of years, to obtain a net yield of more than three and one-half to four and one-half per cent.

It follows that if a credit institution to serve individual and corporate forest owners is organized with these considerations in mind, with proper limitations of loans to a relatively low percentage of the appraised values of forest properties and with all other precautions that are available to guard against losses, lower average interest rates should be provided for forest development than can otherwise be obtained. Experience has proven that in order to insure that all these precautions be constantly observed and that the institution be constantly conducted on a sound basis, public supervision is a necessity. The volume of business available and other factors would render a multiplicity of forest credit institutions wholly ineffective. It is useless to look elsewhere than to the federal government for adequate organization and supervision of a single strong institution or forest credit bank.

Without going unduly into organization details, it may be said that the Federal Land Banks constitute in general the type that must be followed to build up a successful forest credit bank. These banks operate by making, usually through local farm loan associations, loans secured by first mortgages on farm properties. These mortgages collected into lots of several million dollars are used as collateral for bond issues bearing relatively low interest rates. The banks are capitalized by requiring each borrower to take five per cent of his loan in stock of the land bank concerned. In

order to organize these banks and provide funds for the first group of loans it was necessary for the federal government to provide an adequate initial operating fund. The system is not designed to depend on any permanent subsidy from tax payers or the use of federal credit since these funds are gradually being returned to the Treasury as the stock of the banks is sold to borrowers. It has been found necessary, however, owing to the present depression emergency, to provide some additional federal funds and to make a limited use of federal credit to assist in refinancing excessive indebtedness, in order to avoid other still heavier burdens of social relief.

In organizing a credit institution of similar nature to serve any other industry, it is necessary in each case to take into consideration the special characteristics of the industry. This is of peculiar importance in forest industries. If the institution is attached, as believed desirable, to the Farm Credit Administration, that organization already has the necessary specialists to deal with the legal and financial problems common to such institutions. But a successful institution cannot be organized without providing for the services of an adequate staff of trained specialists in the field of forestry and forest industries.

Having provided for the services of the necessary trained technicians in forestry and in finance it follows from the foregoing discussion that the organization must be set up to perform two major services as follows: (*a*) *To assist in reducing existing indebtedness on forest properties.* This can be done through saving interest and financing charges and avoiding risks. The aim would be that in case of loans amortized over a considerable number of years the combined interest and amortization charges will be less than existing cost of interest alone. (*b*) *The second and major purpose of such loans is to facilitate the creation of actual increments to forest wealth of the United States, through building up and protecting the forest growing stock and providing for its orderly utilization.* The burden of this portion of the indebtedness should be minimized through amortization in like manner as described under (a).

It is very important that the forest credit institution adhere strictly to these two purposes. Departure from these principles in the use of credit can readily create serious disadvantages such as fictitious inflation of value and enlargement of taxation against the industry. Both of these create unnecessary continuing charges, and in consequence interfere with the adequate compensation of employees and with providing forest products to consumers at reasonable costs.

The assets available for forest loans include the forest growing stock of merchantable or nearly merchantable sizes, the land, and the forest improvements designed to promote economical utilization of timber, protect the property from fire, and provide quarters for employees. The institution will not desire to be in the land acquisition business through foreclosure and will have no funds to lend on areas stripped of the forest growth unless these form a part of larger forest properties. Forest improvements where there is no growing stock will not have an independent loan value. The key to loan values, therefore, will be maintenance of growing stock. Those forest owners who fail to provide for this will have little or no loanable assets.

Because forest products industries have been operating without much regard to perpetuating the underlying forest resources, that is, on a basis of liquidating their forest properties, it is sometimes inferred that the financial set-up of the industries is unsound. Except in a few individual instances this is untrue. Analysis by the Bureau of Internal Revenue of corporate balance sheets, forming a part of sworn income tax returns, show that bond and mortgage debt as of the year 1928 was equivalent to only 5.7 per cent of the total assets of the portion of these industries operating in corporate form. Net current debt was one per cent of total assets. It is clear, therefore, that most forest enterprises are in a position to utilize forest credit, whenever they enter upon a policy of preserving growing stocks to insure continuous yield. Since the itinerant period of the industry has ended, the choice before each concern will be industrial suicide through liquidation of their remaining holdings or salvation through reserving sufficient growing stocks for continuous yield. Forest loans will be granted solely to afford salvation.

It should further be noted that the regular payment of interest and amortization charges depends on managing each forest property in a manner to make available current growth for cutting operations annually or at least at short intervals. In view of the irregular state of the growing stock in all American forest properties it is hardly worth while attempting to obtain such results except through a selective cutting system with short cutting cycles.

The superiority of vigorously growing timber as the principal asset available as a basis for credit has not been fully appreciated. A recent compilation by the Forest Service of stumpage prices from over 2,000 sales of stumpage made throughout the United States in 1933 and involving nearly two billion feet of timber, shows that in few cases have prices shrunk more than forty per cent from 1929 values. Very few forms of wealth have held up so well. Compared with farm crops timber has a pronounced and definite value as it stands in place in the forest. Few farm crops have much "stumpage" value. Efficient harvesting by the owner is necessary before they acquire such substantial values as timber has even before harvesting operations.

An interesting possibility in connection with a forest credit institution is the establishment of an equivalent to forest insurance through setting aside reserves to cover losses from fire, insects, and disease. It is known that for the United States as a whole, unsalvaged fire losses in timber amount in quantity to about one-tenth of one per cent annually. Disease, insects, and windfall destroy about two-tenths of one per cent annually over and above the normal rates of mortality allowed for in figures for net growth. A Forest Credit Bank having, incidental to its regular loan operation, appraised the property of each borrower might set aside necessary reserves by a mere bookkeeping transaction. In a larger sense, (*Continuing on page* 234)

ASSOCIATION TO MEET IN TENNESSEE VALLEY

The 1934 annual meeting of The American Forestry Association will be held in the Tennessee Valley, October 18, 19, and 20. Knoxville will probably be the meeting place, but details have not been finally settled. Plans call for three days of field trips, arranged so as to give those in attendance a clear picture of what is taking place in the Tennessee Valley, where in the words of Dr. Arthur Morgan, Director of the Tennessee Valley Authority, "a new civilization is being built."

If you are interested in conservation or any phase of land management, do not miss this meeting. The Tennessee Valley is the most interesting and progressive undertaking of its kind in the history of the United States. Subsequent announcements will give further details of the meeting as they are worked out. Remember the dates, October 18, 19, and 20, and make plans now to attend.

WHERE THERE'S A WELL

Recent Experiments in Michigan Develop First Aid to Nature in Fighting Forest Fires by Developing Quick Methods of Tapping Underground Water Systems to Provide Fire Fighters With Emergency Wells Where Needed

By GILBERT STEWART

BIBLICAL history teaches that Moses, tired of thirsty ramblings in a dry land, smote a rock, whereat a stream of cold water gushed forth which relieved the sufferings of himself and his fellow hikers. Moses holds the all-time speed record for developing a water supply, and it is doubtful if anyone will win his title from him. Since his memorable feat the races of men have had to content themselves with more time-consuming methods, and even with the most modern technique of well drilling it still requires days and often weeks to make water issue from the dry earth. But methods do improve. A new technique of well sinking has recently been perfected whereby underground water supplies may be made speedily available, and heavy duty power pumps put into operation within fifteen minutes to combat the worst enemy of nature—forest fire.

Within the last decade tactics employed in the suppression of forest fire have followed the dictates of the machine age; they have changed greatly from the purely manual methods of ten years ago. Today automobile trucks, tractors and plows, power-pumps, and specialized hand implements have supplanted in large measure the ax, shovel, and rake which comprised the chief tools of the fire-fighter prior to 1920. The experience gained during the last decade in the use of mechanical equipment has served to allocate the several types of machines to their fields of greatest usefulness. It is now generally recognized that no one type of machine is universal in its application; that serious mistakes and heavy losses frequently result from improper allocation of machine equipment in fire suppression. In other words fire fighting is a specialized business; the tactics and equipment employed depend entirely upon terrain, type of cover, natural barriers and behaviour of the fire.

From the bosom of the earth to the nozzle of the firefighting hose in ten minutes or less! Now an emergency well may be sunk almost immediately wherever needed by using the new hydraulic method of sinking a well. This picture shows the first steps. The washing nozzle is inside the casing. The hose leads from the pump to the nozzle which controls the action of the washing stream at the bottom of the casing. The pulley frame aids in handling the nozzle from the ground while it is still high in the air. This casing is eighteen feet long.

Among the mechanical appliances that have become common in combating woods fires is the power-pumper. For certain types of work no other kind of equipment can equal the pumper in effectiveness. When properly used it is worth its weight in gold. If water can be directed onto fire where and when it is needed, and in sufficient quantities, there is no quicker way of extinguishing it. However the matter of where and when has been the stumbling block in the successful use of pumping equipment.

In general it is cus-

Dropping the well pipe and screen. The seating of the casing created a hole and exposed the water table. The open casing is then ready to receive the screen as shown. After the screen is in place at the bottom of the well hole, the casing is completely withdrawn from the ground leaving the screen and pipe in the ground ready for pumping.

tomary to transport pumps and hose to the scene of the fire, and to select a pumping site at a stream or lake as close as possible to the proposed point of attack and lay the hose line accordingly. If the fire is within reach of a short hose line, a powerful stream of water can be delivered at the point of attack within a short time. If, however, a long hose line is required difficulties arise thick and fast. It is a real task properly to lay a long hose assembly; moreover line losses, due to internal hose friction, mount up tremendously, and with the average small portable pump a disappointingly small stream of water too often issues from the nozzle. If the fire is spreading rapidly then begins a race that is usually lost at the outset; frequently the front cannot be held, and additional hose cannot be laid fast enough to stop it. At this point seasoned fire fighters usually abandon pumping tactics, and get the tractor into action again, or the old timer starts out once more with his back-firing torch and a very definite plan of action in mind.

No other kind of equipment has had hotter arguments waged over its value in forest fire suppression than has the power-pump. Practically every fire organization has had this same experience, and with many of them it is still a moot question as to whether or not pumps can justify the relatively high investment in the apparatus itself together with the complement of hose.

Power-pumps have been used extensively in Michigan since 1925, but until recently were not employed on more than five per cent of fires actually suppressed. After fair trial the opinion had been pretty well formed that pumps were valuable enough under certain conditions, but that these cases were too few, and that favorable pumping chances were too rarely found to warrant extensive investment in that particular type of equipment.

Within the past two years, however, this opinion has been entirely reversed, and in the future power-pumps will be widely used in combating forest fire. It has been found that glacial regions of Michigan abound in pumping sites, and that abundant supplies of water can be made available for the suppression of practically every swamp fire, and a high proportion of upland fires. The problem of water supply has been solved through the use of temporary wells of high capacity, which can be established and put into operation within a period of fifteen minutes to half-an-hour.

Almost to full depth now! The return flood is now overflowing the rim of the casing. It is cleared of all material held in suspension by continuing the washing process until the return flood is clear and free of all soil particles. The time required to sink the casing to full depth was about two minutes. From seventy to 125 gallons of water are adequate, depending upon the resistance encountered.

The application of well pumping in forest fire suppression was developed at the Michigan Forest Fire Experiment Station. A new hydraulic method of well sinking has been perfected that is simple and rapid. It is adapted to the establishment of wells to a depth of thirty feet or more; consequently all underground water supplies within reach of suction pumps can be made available. This new development is a radical departure from old and accepted methods of fire fighting. Even though it is simple it is highly specialized and materialized as a result of research work dealing with the application of power pumps. It was well known that pumps have great possibilities where water is abundant, but that they were doomed to obsolescence unless more widespread and more frequent use could be made of them.

This new method of well sinking is a simple hydraulic process, and the establishment of a well is a matter of minutes. During the past year wells were frequently put into operation for fire suppression in fifteen to thirty minutes. A well trained crew of three men, working against time have repeatedly sunk wells and operated them within eight minutes, the yields ranging from forty to seventy gallons or more per minute, depending upon the capacity of the pump used.

The equipment required to sink wells is simple and inexpensive. A power pump, a tank of water, a casing, a casing wrench, a washing or jetting nozzle made of three-quarter inch pipe, and fifty feet of hose will suffice. For convenience a tank of 250 gallons capacity is mounted on a truck. Up-to-date outfits are provided with light, collapsible derricks to simplify the handling of long casings and well pipe. The best casings are made of boiler tubing of three and one-half or four inch diameter; they are provided with coarse teeth on the leading rim which aid greatly in piercing heavy soils and gravel layers. The casing wrench is a special tool which is absolutely essential; it can grasp or release its hold on the casing immediately, and can rotate it in either direction. It is the implement with which the casing is handled and controlled. The washing nozzle is the means by which the washing stream is controlled. The well equipment from which ground water is pumped consists of two inch well pipe and specialized well screens.

When properly used, the power pumper is worth its weight in gold. This shows the correct hook-up of the pump with the well for maximum pumping service. This particular well yielded sixty-seven gallons a minute with a pump pressure of 125 pounds, and a trained crew of three men put it into operation in less than ten minutes!

An emergency met effectively by mopping up a swamp fire with water supplied by wells. The running head of the fire had been stopped, but a hazardous front still remained. It was completely extinguished by two wells along an extensive fire front. The yield in this case was about forty-five gallons a minute, with pump pressures around 130 pounds. Nine hundred feet of hose were operated from each set-up.

When a well is sunk the power-pump is connected with the water tank by means of a suction hose: a discharge hose leads from the pump to the washing nozzle. The casing is placed erect with the washing nozzle inside of it. After the pump is started water is drafted from the tank and discharges from the tip of the washing nozzle under pressure; it washes a hole in the ground into which the casing sinks as rapidly as soil is displaced ahead of it. In order to properly control the action of the washing stream with relation to the casing, the tip of the *(Continuing on page 237)*

HEPATICA - - MY GEM OF PEACE

Entering the woods by a small stream, I am ever watchful, even while listening to the early morning notes of the birds, or observant of the waking buds about me, for that happy harbinger of Spring, the lovely Hepatica. There are many fair flowers which grace the first spring months, but none quite so fair as this woodland fairy. The more charming, perhaps, because of the walk among the oaks, maples and beeches where one comes upon it, nestled amid brown leaves in a moist nook. One kneels hopefully to partake of its divine fragrance, which it holds as a gift to perfume the little world about it when the Dew Goddess passes by. Its individual charms awaken anew sentiments for the beautiful, and I linger long beside it. After the chaotic conditions in a work-a-day life that so weary body and mind,—what peace this woodland gem tucks into the heart! scattering sweet memories over the cold bareness of every day. "Fair, O fair!" it seems to breathe; "O holy, holy!" as if some fairy's heart were alive in its roots, and, caressed by the God of Spring, it bloomed.

There is such a refining influence in studying its secluded life, and a strengthening of courage to understand the wonders of its sweet and silent ways. Each expanding flower has its delightful time of bloom when the fuzzy little unfolding buds, like hoods, turn back and the fair faces blush in the glory of the morning sun. One cluster may have several shades of flowers, from white through pale lilac, with a delicate tinge of violet, or a touch of the azure sky blended in. How the minute anthers shine on the expanded violet blooms, like stars against the far off firmament at dawning! A bit of heaven dropped down as a gift that one must kneel to partake of its glory. There is its gift of fragrance, like a genius, not revealed in its closest kin. There is its gift of beauty, borne of the same charms but not of color. What finer emblem could Spring send to tell us she is coming!—arrayed in, not just one, but many, delicacies of color, fragrance, and beauty.

Hepatica triloba, now called H. americana, *or even its common name, Liverwort, suggests nothing of its charms, and I always think of it as "my gem of peace." It is a true American flower, a virtuous token, that awakens the senses to see, to touch and hear, and breathe into the soul . . . . Oh, Hepatica,—that I may live to be as courageous, as richly giving, as humbly sweet as thou!*

—Mary Louisa Hellings.

BABY STYLES IN BIRDLAND

By

IRA N. GABRIELSON

Photograph by L. D. Bailey

This Red Shafted Flicker knows the cares as well as the joys of motherhood.

ALTHOUGH all young birds emerge from eggs, there is an astonishing variation in them running the scale from beauty to ugliness and back again. Curious-looking youngsters they are that get their start in the world by the prosaic process of breaking an egg shell. Some of them are born naked, blind, and helpless. Others are alert, pert little bodies covered with soft down, often beautifully marked with intricate patterns. Between these two extremes are found almost limitless variations.

Curiously enough, some of the more primitive forms of birds compete strongly in point of unprepossessing offspring with the families of birds considered highest in the evolutionary scale by modern ornithologists. In fact, beauty or lack of beauty in extremely young birds runs in families, so to speak, much more uniformly than it does in the human race. Extremely young birds only an hour or two out of the egg are generally ugly although such widely dissimilar families as grouse, quail, sandpipers, plover, hawks, owls, ducks, and geese, claim the lion's share of the juvenile pulchritude allocated to the bird world. It is this conglomerate group—from a taxonomic standpoint—which wins most of the juvenile beauty contests in the avian world, each species sticking to its own particular style of beauty. The babies, fluffy mosaics of black or brown against a background of soft gray, white, brown, or yellow, are equally irresistible in all the species nesting in this country. A mother quail, anxiously herding a dozen thimble-sized balls of down across a highway in the twilight, has on occasion halted an onrushing automobile until the last of the stragglers were safely across. If the youngsters had been ugly and awkward, would the car have stopped?

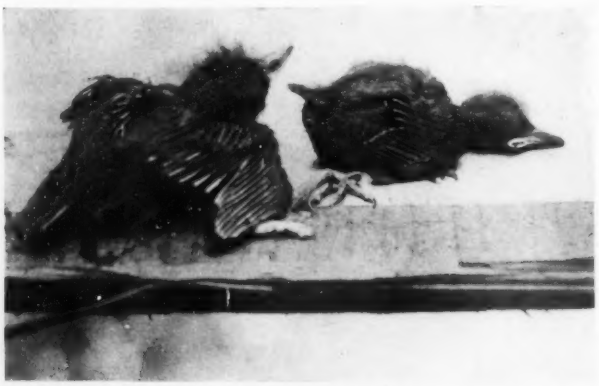
There is a limitless variation in the beauty of birds at birth —ranging from the stark naked, blind and helpless—most unbeautiful type—to those that arrive alert, with pert little bodies covered with soft down. Young long-eared owls develop a regal mien at a very early age.

A baby killdeer is a thing of beauty both in line and color. Alert, able to shift for itself almost from the time the last kick frees it from the shell, it is thickly and uniformly covered with a soft, silken down, gray-white in color, to furnish a perfect background for the intricate pattern of black or brown which effectively breaks up the outlines of the body

Photograph by Frank R. Ostler

Representing the "in-between" group, heron babies—while winning no beauty contests — are neither beautiful nor homely. This little chap, with his knowing eyes, shows the outstanding characteristics—the fuzzy covering, the too-large bill and big, awkward feet.

Predatory babies—young Marsh Hawks, whose eyes already show the savage killer nature which is their natural heritage. These youngsters demonstrate the stepladder effect in the hawk family. This is due to serial incubation—an odd kink prevailing among the predators.



Young Crested Flycatchers, just before the final development of the larger feathers. They arrive in the world nearly naked, blind and entirely helpless. They are only able to raise their heads and beg for food and keep their parents endlessly busy trying to satisfy their enormous appetites. It takes time to develop their beauty and independence.

as it crouches beside a clod of earth. It is beautifully proportioned, strong, and alert, a typical representative of the praecocial birds which are born with development advanced to the point where the newly hatched youngsters are able to run about and feed themselves immediately after hatching.

One of my most amusing mental pictures of the behavior of young birds carries me back to an Iowa farm. Here, in cutting the hay crop, it sometimes happened that the sickle-bar cut into a belated blue-winged teal's nest. When this happened, the unbroken eggs were taken home and carefully placed under a "setting" hen, of which there seemed to be a permanent supply. The tiny teal, in yellow and brown uniforms, were a never-ending source of amusement in those

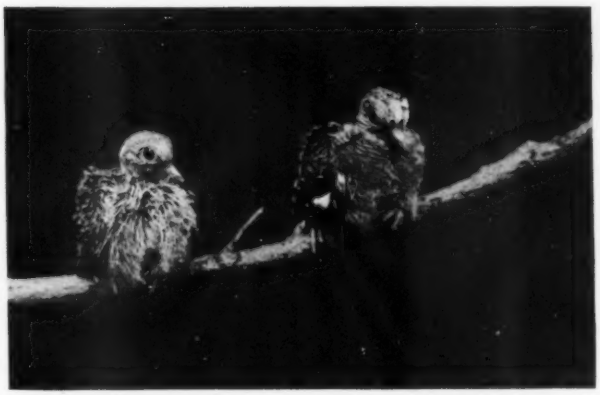
This bewildered little screech owl has just taken his first flight from home.

pre-auto and pre-movie days. They were so small and so quick in contrast to the Pekin ducklings and barred-rock chicks that I can still visualize them darting like destroyers among the bigger, slower-moving fleet of barn-yard dreadnoughts. Occasionally in their pert haste, trying to take a corner in high, one would lose its footing and roll over and over, only to catch its feet and dart onward again with scarcely a perceptible break in its speed.

Unfortunately these beautiful babies lose much of their charm as they grow older; the down coat becomes thinner as they increase rapidly in size, and the wing and tail quills grow with almost miraculous speed, particularly in young grouse and quail. In a few days these youngsters are able to fly with the down still covering parts of their bodies. While this is an excellent safety device, it is no beauty

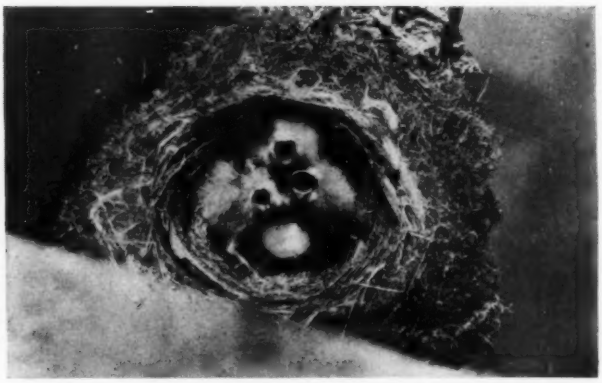
accessory, and for several weeks the growing youngsters slip rapidly down the scale of avian pulchritude.

On the other hand, young hawks and owls, not so well developed at first, soon catch up to these more precocious youngsters. True, the predatory babies are covered with a dense coat of soft white down, but they are somewhat too helpless and awkward during the first few days of their lives, to be really beautiful. The parents feed them on bits of meat or insects, and on this strong diet, they soon become alert and regal in appearance. Even in the baby stage, their eyes show the savage killer nature which is their natural heritage. By the time they are able to hold up their heads and fight among themselves over the tidbits brought by their wide-ranging parents, they are exceedingly attractive children.



One of the homeliest of the bird babies at birth is the smooth and beautiful Mourning Dove. Hatched naked and helpless, it is everything a bird should *not* be up to the last few days in the nest. These youngsters, though their coats are still rough, will soon be clothed in soft, dove-like beauty.

Bright-eyed young Least Bitterns. Along with other herons, they belong in the middle class of bird beauty.



Phoebes also belong to the helpless group—though they are covered with a lovely soft downy coat. Their beauty concerns them not at all. Their whole tiny being is consumed with one thought—*food*. And they keep their parents dizzily at work from daylight to dark supplying their needs—in defiance of all human N. R. A. codes.

But, oh, what a difference just a few feathers make! These smart young fellers are kingbird babies—all dressed up for the Easter parade, and poised to the nth degree.

One of the odd kinks developed in the predator group of birds is shown in the incubation of the eggs. Most bird-mothers lay the full set of eggs, be it four or fourteen, before taking up their exacting household duties. In this family, however, incubation starts with the laying of the first egg. Other eggs are deposited at intervals of a day or two, consequently embryonic development is well along in the first before it has begun in the last. Perhaps this habit is correlated in some way with the fact that many predatory birds begin nesting at such an early date that cold and stormy weather is the rule rather than the exception. The great-horned owl begins laying (*Continuing on page* 238)

Photograph by Ray Atkeson

"Mountain Hemlocks"

Taken at Timberline—Mount Hood, Oregon

★ *"The winds that drive the hissing sleet and ice are still,*
While daintily the dawn steps forth to tiptoe down the hill."
—JOHN PHELPS.

Winner of Fifth Prize—National Competition Conducted by
The American Forestry Association
for
Beautiful Photographs of Trees in America

EDITORIAL

Saving the American Elm

MR. CHAMBERLIN'S article on the American elm, published in this number of AMERICAN FORESTS, arouses a poignant realization of the tragedy in store for hundreds of communities and thousands of homes if the Dutch elm disease, now in an incipient stage in eastern states, is not stamped out promptly and completely. The tragedy assumes a national aspect when one visualizes all America bereft of its elm trees. That is the shadow that the Dutch elm disease has thrown across our land, for the disease is a fatal one to the elm and once out of control the country's most illustrious tree is doomed. In neither Europe nor America, the United States Department of Agriculture states, has any cure been discovered for a tree infected with the Dutch elm disease.

This country is rich in the number, variety and magnificence of its native trees. With over a thousand native species the question might be asked, what difference does one species more or less make? We have lost the chestnut, at least over a large part of its natural range, and other trees are taking its place. Why worry about losing another species—the elm? No one will ask that question after reading Mr. Chamberlin's appreciation of the tree and the part it has played and is now playing in the life of our country. He awakens the mind to what all America must feel when it stops to consider—that no tree can replace the American elm in the hearts of our people. The tree, he points out, has become all but sacred to our land not merely because it is a beautiful, gentle, hospitable tree, but because it has entwined its roots and limbs, its whole living being into the family and community life of millions of our people. And by individuality and long association it typifies as no other tree does the finest things in American life. No substitute greenery however luxurious could hide the scars that would be left by the loss of the elm.

There is no necessity of losing the American elm. It will be saved if the American people rally to its defense. Of all the trees worth fighting for, Mr. Chamberlin reminds us, the elm comes first. The disease which now threatens it is a deadly enemy that calls for our best fighting spirit, a spirit that gives no ground and wastes no time. With the experience of the chestnut freshly in mind, our course of action should be clear. The Dutch elm disease is in its beginning stages, when it can be most easily and economically eradicated. The forces competent to do the work are the experts in the federal and state services. If they are provided with needed assistance and funds to wage effective warfare before the disease gets out of hand, the elm will be saved.

They are already alert and in the field. The Department of Agriculture through its Division of Plant Disease Eradication and Control has organized the work in cooperation with state, county and local authorities. Infected trees are being located and destroyed as far as possible, because such trees will die within one or two years and may cause infection of healthy trees. These forces of control need and desire the cooperation of persons everywhere in detecting signs of the disease and in carrying out the inspection and eradication work. The greatest contribution we believe the general public can make in saving the elm, however, is in demanding that the control forces be provided with adequate funds with which to deal with the menace. Failure on this score at the outset will be fatal.

Herein lies the most alarming phase of the situation at the present moment. Congress already has shown a tendency to squeeze dollars in coping with the elm menace. The Department of Agriculture after taking the measure of the Dutch elm disease as it now threatens asked to be armed with an authorization of $600,000 upon which it could draw as needed to assure adequate handling of the situation. Congress, however, granted only $150,000. If the emergency calls for additional amounts this summer to hold the disease in check, the only recourse would seem to be to Public Works or Civil Works Funds. It is to be hoped they may be available; otherwise the battle will have to wait until Congress meets next winter.

The best insurance, we believe, against losing the American elm is a demand expressed in no uncertain terms by the American people, individually and collectively, upon their representatives in Congress and in the state legislatures that the elm must be saved. The time for the people to act is now, and all the time until their representatives are able to report back that the elm *is* saved.

Lumber Industry Embarks Upon Forestry

President Roosevelt Approves Supplement to Lumber Code That Regiments Whole Industry Under Conservation Program of National Scope

PRESIDENT ROOSEVELT on March 23 placed his signature upon a document that ushers in a new era in American lumbering. On that date he approved supplements amending the Code of Fair Competition for the Lumber and Timber Products Industries which call upon the industry to initiate measures necessary for the conservation and sustained production of forest resources. The amendments, which were recommended by the Lumber Code Authority, carry out the conservation commitment given by the industry in Article X of its code when the code was first formulated last July. They likewise carry out the principles of forest practice recommended by the forest conference of industry and public representatives held in Washington on January 25. Their speedy accomplishment is in no small measure due to the leadership of the industry itself in making the National Recovery Act an instrument to place its forest operations on a permanent basis of sustained yield.

Article X of the Lumber Code now provides that beginning June 1, 1934, the adoption of certain prescribed woods practices designed to keep forests growing on the land shall be obligatory for all persons subject to the jurisdiction of the Code. While the Code amendments prescribe specific principles of conservation practice to be adopted they further call upon each division and subdivision of the industry to formulate prior to April 15th more detailed rules of forest practice applicable to local forest conditions prevailing within their regions. They also provide for the administration and enforcement of conservation activities through the Lumber Code Authority and divisional agencies upon each of which federal and state authorities are to be represented by non-voting advisory members.

The approved amendments are of such nationwide importance and significance that they are quoted in full below.

Schedule C — Forest Conservation Code

Add the following new "Schedule C" to the Code of Fair Competition for the Lumber and Timber Products Industries:

These supplements to Article X provide for the initiation and administration of measures necessary for the conservation and sustained production of forest resources by persons within each Division and Subdivision in cooperation with the appropriate State and Federal Authorities, it being recognized that the extent to which these undertakings by the lumber and timber products industries are capable of successful accomplishment is dependent upon the extent and character of public cooperation in each state.

SECTION 1. Each Division and each Subdivision having jurisdiction over forest utilization operations shall establish or designate an agency or agencies to formulate and from time to time to revise rules of forest practice, and to exercise general supervision over the application and enforcement thereof in the operations of the persons of the respective Divisions and Subdivisions. Such agencies shall have as non-voting, advisory members one representative of each of the State and Federal organizations which have definite responsibility under State and Federal laws for forestry or forest protection practice within the several Divisions and Subdivisions. Each Division and each Subdivision shall provide such technical and other qualified personnel as may be required to furnish necessary information to said agencies and persons, to inspect the forest operations of said persons, to enforce such rules of forest practice, and otherwise to carry out the purposes of this Schedule, under the said general supervision of said agencies. On or before April 15, 1934, each such agency shall formulate such rules of forest practice and shall submit them through the appropriate channels to the Authority for its approval, provided, however, that prior to or at the time of the submission of such Rules of Forest Practice to the Authority for its approval, such agency shall publish such rules in its Division or Subdivision and shall take such steps as are reasonably calculated to notify all affected parties of the provisions thereof and that objections to or criticism of such rules may be filed with it or the Authority within fifteen days after the date of publication. After such approval the Authority shall publish separately for each Division and Subdivision, and shall submit to the Administrator together with a summary of objections filed, approved forest practice rules, which, on and after June 1, 1934, unless prior to that date such rules shall have been suspended or disapproved by the Administrator, shall be obligatory for all persons subject to the jurisdiction of the said Divisions and Subdivisions, respectively. Upon application by a Division or Subdivision, or upon its own initiative to secure compliance with this Schedule and equal application thereof within and between the several Divisions and Subdivisions, the Authority may amend such rules of forest practice; such amendments shall be published by the Authority, together with a notice that objections to or criticisms of such amendments may be filed with the Authority within fifteen (15) days after the publication thereof and shall be submitted to the Administrator, together with a summary of the objections and criticisms filed with it, and shall be effective thirty days after the date of such publication, unless prior to that date such amendments shall have been suspended or disapproved by the Administrator.

SECTION 2. Said rules of forest practice, to insure the conservation and sustained production of forest resources, shall include practicable measures to be taken by the operators to safeguard timber and young growing stock from injury by fire and other destructive forces, to prevent damage to young trees during logging operations, to provide for restocking the land after logging if sufficient advance growth is not already present, and where feasible, to leave some portion of merchantable timber (usually the less mature trees) as a basis for growth and the next timber crop. Said rules of forest practice shall be adequate to secure the purposes of this Schedule, and in a prac- (*Continuing on page* 236)

FROM THE DIARY OF A TRAIL RIDER

By CARMEN HAIDER

Where the trails of the wild will lead this summer. Let's go!

THEY called me the "morning dipper." Sousley, the head ranger, gave me the name because of my early morning dips into the cold water of the mountain streams. On the first morning Grace had gone along—had, indeed, taken the initiative by waking me at five o'clock. But after that I was left alone to my sunrise pilgrimages to the invigorating rapids and pools.

It was all a part of the unexpected joys of the first expedition of the American Forestry Association's Trail Riders of the National Forests into the Flathead National Forest, in Montana, last July. I had expected intriguing trails, rare wild beauty and congenial fellowship, but to have all of these and more for the taking made me frequently pinch myself to see if I was really awake.

On the very first day out we learned that a good lunch is extremely important. Light-minded, unaware of the dangers of the wilderness, we had stepped from the automobiles at Monture, taken a good lunch, impatient to begin the ride. Oh, those beautiful forests! Following the trail closely behind Joe Murphy, our guide, we for the first time felt the stillness of the undisturbed forests. At the beginning, I conversed with Joe as to the effect of the depression on the West. In the following days I forgot all about it. One could think of a world of cities and of noise, of advertisements and of hurry beyond the mountains, only with great effort. Was there a world yonder? Did people have problems? How could there be hatred, envy, bloodshed, depression in so beautiful a world?

The surprise of that first supper! The bags yielded several pieces of old iron which when properly fitted together by the experienced hands of Whitey, our cook, turned out to be a regular stove. Now there was no more fear that we would have to give up delicious meals as a prerogative of the civilization we had left behind. Subsequent days proved that it was not due to our over-stimulated appetite on the first evening that we gave three cheers to the cook.

Satisfied, we sat around the fire awhile longer. It was now completely dark except for the stars above. I remembered that I had not yet decided upon a place to lay down my sleeping bag, but I had never done that before and was quite helpless. Here for the first time Peg revealed the kindness which was to characterize her all through the trip: she and Grace, the reserved, immediately went over with me to get the bag and lay it down beside their own. I crawled in. What a delightful sensation to lie there in the open, to gaze up at the tree tops and beyond them into the night; to fall asleep soon, physically tired and happy. The unusualness of it all wakened me during the night. Morning must have been coming, for the sky was light.

Thus came the second day. Winding up the Monahan Mountain Trail, we came to meadows of Alpine flowers, splendid in the sun. We crossed the first creeks, and rode through the mud where the earth was still wet from the snow that had disappeared only a short while ago. And then we came to the snowfields themselves. Brown, our photographer with his never-fading smile, would ride ahead, dismount and get a moving picture of the group stamping through the snow, the horses breaking in knee-deep in mid July. We climbed and climbed. Sousley, the ranger, came to meet us and led the way to Foolhen Lookout. There was no path. In single file our horses followed Sousley and Joe Murphy, heading laboriously against the wind which was sweeping down from the slope. But not one of us minded, although we were following the very rim of the mountains and a stronger gust might have lifted us out of our saddles. Who could think of the wind, when there lay range upon range of mountains to the right, to the (*Continuing on page* 232)

FIELD AND FOREST FOR BOYS AND GIRLS

By JOHN HARVEY FURBAY

Illustrated by William D. Vennard

THE COURTSHIP AND NESTING OF BIRDS

THE joyous return of the birds in spring signals a general awakening of life and activity all about us. The grass is preparing a soft carpet of green; trees are bursting their buds; flowers are diffusing their fragrance; and myriads of living things that have been quiet for months are now astir. This is the season which takes thousands of people into the woods and fields to enjoy nature in all her vigor and romance.

The male birds are usually the first to arrive in the spring, the older birds preceding the younger. Those which will nest farther north usually come earlier than those which will nest about us. They are called "transients," and may come in great waves from the south, flooding us with beauty and song for a few days, then pass on. One is likely to see many birds in early spring which he does not see again all summer. This is the time you will enjoy your bird guide-book. Among the first summer residents to arrive are the male robins and bluebirds. The males of other birds follow, and after them come the females. Many birds are very regular in their return year after year, and arrive each spring on the same date. If you have a pair of birds nesting every year in the same bush near your home, keep a record of the day they arrive for several successive years and you may get some surprises.

As soon as the males arrive, they select particular areas within which their nests will be constructed later. Perhaps these could be called "territories." The male then spends most of his time in his selected territory, defending it and driving off other males of his species. The size of the territory depends upon the feeding habits of the bird, and on the number of his species in that vicinity. Song sparrows, robins, and catbirds require rather large territories, for they secure their food near their nests. Swallows, on the other hand, occupy very small territories, and secure their food at distant points; nevertheless, each nest has its own small territory on which other swallows dare not trespass.

Early in the season there may be a great deal of fighting over the boundary lines of the adjacent territories, but definite limits are soon fixed. The older males which arrive first take the most desirable locations, and the younger ones which follow have to take what is left, often filling in the gaps caused by the death of older birds. It is believed the average life of birds is about five years.

As soon as the females arrive, each male devotes himself ardently to the task of attracting a mate to the territory which he has been defending so valiantly. Various methods of attracting the attention of the females are employed. These include singing, display of the plumage, fighting other males, and performing many curious aerial antics.

Song is the most conspicuous feature of bird courting. Males are the best singers, and they do most of the singing. They employ their songs chiefly in courting the females, and usually cease singing—like modern husbands—as soon as they have won their brides, and started their families. Song sparrows and red-eyed vireos may continue their music even during the moulting season in August or September when other birds are usually silent. The females of a few species sing as well as the males, but their songs are always more timid. Female cardinals, purple finches, and a number of tropical American wrens sing operatic duets with the males during the courting season.

Singing birds usually choose conspicuous places from which to sing, because their purpose is to attract attention to themselves. They mount the tops of bushes, trees, and posts, and announce their presence to the surrounding world. Some birds sing while on the wing. The European skylark is noted for beautiful flight songs, while our own horned larks are hardly less remarkable.

Certain birds sing at night. The European nightingale is of ancient fame in this respect. Our own owls and whip-poor-wills sing and make various calls at night; and, during the height of the mating season, the song of almost any bird can be heard ringing out on the still night air. The mockingbird of the southern states does some of its best singing on moonlight nights, and has been mistaken for the nightingale. The drumming of the ruffled grouse and the tatoos of the woodpeckers serve the same purpose as songs. These birds will return to the same log or post day after day or night after night, just as other birds will mount the same twig or gable each day to sing.

After the females have been attracted to certain territories, the males may do considerable fighting to keep out other males. The winner gets both the territory and the

female over which they were fighting. An elaborate display of plumage is used by some birds in courtship. The peacock is a well-known example of this. The male turkey is seen "strutting" in the barnyard, and in the fields are the ruffed grouse, and pheasant, and the nuthatch, displaying their finest colorations to the females of their kind. The woodcock and the horned lark supplement these displays with various other antics such as dances and aerial evolutions in order to attract the females.

After the females have been won, the pairs settle down to home-building. Most birds live in pairs. The English sparrow is polygamous, however, and mates with many females. Certain birds seem to mate for life, while others appear to select new mates each year. The birds which remain with us all winter, such as the owls, seem to mate for life, while most migratory birds select new mates each season.

There is probably no time of the year when birds are more interesting than during the nesting period. Bird migration attracts the attention of many people, and the evening choruses of courting birds provide pleasant hours, but one gets his most intimate glimpses of bird-life during the nesting period. During these days birds remain in the same place long enough to be studied. After the birds have mated, their first desire is to build a nest. At least this is true of the female. The lady wants and demands her home. The male has already selected the "territory" within which the nest will be built, and the female accepts this territory when she accepts the male for a mate. It is the task of the lady, however, to select the particular site within the territory where the nest is to be built. Too, she usually has the responsibility of constructing the nest, and often she does all of the work while the male hops about nearby and sees that no other male or even female of his species intrudes. He sometimes accompanies the female on material-gathering trips, but does not assist her, for she prefers to build the nest herself, and usually rejects any material offered by him. Perhaps he does not know the right kind of material for nests when he sees it. Female wrens usually throw out the nests carried in by the male during courtship.

The factors that determine the selection of a nesting-site are chiefly the necessity for concealment, the accessibility of feeding-grounds, and protection from bad weather. Even though the greatest care is exercised in the selection of the nesting-site, casualties are numerous, for the dangers which threaten the homes of birds are many. Dr. Arthur A. Allen says that less than one-tenth of the nests built by birds remain undamaged until the young reach maturity, and that only about one-fifth of (*Continuing on page* 233)

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There is just one requirement and that is to enclose a self-addressed stamped envelope with your request. I do not sell bird houses or anything else. I send these plans free to anyone, anywhere in the United States, because I love birds, especially bluebirds, and like to tell how to provide them with suitable nesting places.

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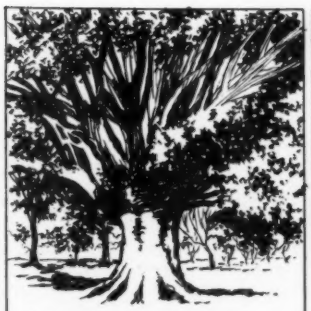
FAMOUS TREES EVERY BOY AND GIRL SHOULD KNOW

No. 13 - - -"BATTLE GROUND OAK" AT GUILFORD COURT HOUSE



THIS FAMOUS OLD TREE, KNOWN AS THE "BATTLE GROUND OAK," THE "LIBERTY OAK" AND THE "CORNWALLIS OAK", IS LOCATED ONLY A FEW HUNDRED YARDS FROM WHERE THE BATTLE OF GUILFORD COURTHOUSE, AN IMPORTANT COMBAT OF THE AMERICAN REVOLUTION, WAS FOUGHT IN 1781, IN NORTH CAROLINA

NATHANIEL GREENE, THE AMERICAN GENERAL, DIRECTED THE BATTLE FROM NEAR THIS TREE—THIS BATTLE, MANY HISTORIANS CLAIM, DECIDED THE REVOLUTION AS IT WAS WON BY THE BRITISH ONLY AT THE COST OF ULTIMATE DEFEAT—IN OCTOBER OF THAT SAME YEAR CORNWALLIS SURRENDERED TO WASHINGTON AT YORKTOWN—TRADITION HAS IT THAT DURING THE BATTLE GENERAL GREENE TIED HIS HORSE TO THIS TREE, AND THE HORSE NIPPED THE TOP OF IT CAUSING THE MULTITUDE OF BRANCHES

NATHANIEL GREENE, NEXT TO WASHINGTON THE ABLEST STRATEGIST IN THE AMERICAN ARMY, WAS BORN IN RHODE ISLAND—HIS MOST BRILLIANT WORK WAS DONE IN NEW YORK AND LATER IN THE CAROLINAS, WHERE HE WORE OUT CORNWALLIS AND LED TO THE LATTER'S DEFEAT AT YORTOWN—GENERAL GREENE DIED ON HIS GEORGIA ESTATE, MULBERRY GROVE, IN HIS FORTY-THIRD YEAR—

"WHAT THE C.C.C. HAS DONE FOR ME"

AMERICAN FORESTS here presents the fifth of a series of stories written by enrolled members of the Civilian Conservation Corps and selected as the prize winning contributions in the Magazine's recently concluded contest on the subject "What the Civilian Conservation Corps Has Done for Me." Limited to enrolled members of the Corps and to manuscripts of one thousand words or less, the contest brought hundreds of stories from the fifteen hundred camps which dot the country from coast to coast.

These stories form a remarkable narrative of human experiences and are unquestionably the best spoken evidence thus far available of the real value of the Civilian Conservation Corps to the youth of America and to the thousands of homes which they left for the "road" in search of work to help distressed parents.

The five prize-winning stories were published in the January and February issues. One of the stories awarded "Honorable Mention" is published in this issue. A brief biographical sketch of the author is given on page 240. In accordance with the contest announcement, awards have been based upon the story and not its literary construction. All manuscripts, therefore, are being published as written and without editing.—*Editor.*

'I HAVE LEARNED TO KNOW THE HUMAN RACE'

By Harold H. Buckles

Camp F-21-W, Civilian Conservation Corps
ENCAMPMENT, WYOMING

Harold H. Buckles

I JOINED this company July 15 as a local experienced man six weeks after the company had come to Wyoming.

It will be long before I forget my feelings that Saturday afternoon as I strolled about the camp waiting for orders.

I couldn't help saying to myself, "Lord, lord, are these the creatures I must live with?"

It seemed to me I had never seen such an array of ragged, slouchy poor white trash. They didn't walk across the area; they shambled. Stoop-shouldered, puny, whining, grumbling about the food, the work, the climate, their clothes, their commanders.

"Just another kick in the ribs from the gods of destiny," I told myself. I was pretty low; it had been two years since I had had a real job; I had thirty-five cents, a brave and charming wife, and two pretty sweet little boys; and everything I had touched in that two years had phooied. The C.C.C. was a fluke, a last hope; and a pretty slim hope it was, I told myself.

I am writing two months later. Today I am proud to say, even to people I knew when I was more prosperous, "Come up to our camp sometime; I want to show you a real bunch of men. And I want you to look over the work we've done; the next time you hear anyone talk about wasting public money on this forest work, I want you to be able to tell them that Medicine Bow National Forest has had work done on it this summer that couldn't be duplicated by ordinary methods for twice the money."

And I mean it. The bums that made me shudder two months ago are real men now. When they move across the area way today they don't walk; they stride. Their eyes are clear and sparkling; their shoulders are erect; they swing easily in their walk the way woodsmen do.

And when they talk, it's more like this: "Say, I can cut more trees in a day than you can in a week. You should have seen some of those big trees we moved today. I'll bet they were gray-headed when Columbus was a baby. Won't they *ever* blow that chow whistle? I could eat me a cow red and raw."

That's the change in the boys I have been working with. The change in my own attitude has been parallel and complementary.

Three months ago I felt licked—licked at thirty-one. I couldn't get a job; I couldn't write anything that would sell. The snap was gone from my stuff; I couldn't even sell two-line wise-cracks to the funny magazines; I could sell a little straight newspaper stuff; but at present column rates I couldn't even buy milk for the kids on a month's turn-out.

For two months I have known that I didn't have to worry about finding at least a little money in my hand on payday; it wasn't much, but it fed and clothed and sheltered my little brood; a few days after I came up here some one discovered that I had been a reporter, and I was set to work writing camp news and publicity. I started a little mimeographed camp newspaper. I was given free rein in the way I handled it—and maybe you think it isn't wine to my nostrils when I walk across the area on one of those days when everything has been slow and the paper is late and the boys yell "Hey, Buck, where's our paper?"

I believe that in another month I shall be able to start writing again; this time I believe the stuff will click. I thought I knew all there was to know about the human race, the so-called human race, as Mark Twain put it. I didn't; I knew the cheapness, the double-crossing, the injustice, the treachery and brutality of it; but this summer I learned something about the essential fineness of it, the friendliness, the redundant vitality of it. Naturally, I am looking for a better job; everyone is; but I am going to be sorry when I find it. I shall hate to leave the boys who taught me that Christ was not all wrong.

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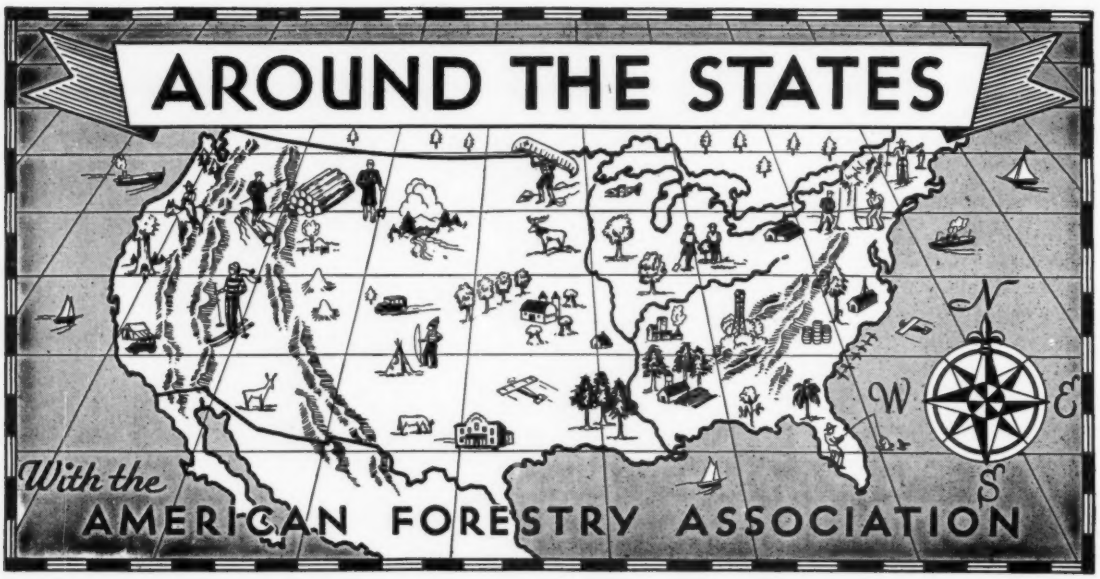

Wallace Moves to Protect Game on National Forests

Approves Regulation Giving the Forest Service Broad Authority to Manage and Develop Wildlife Resources of Federal Forests

Secretary of Agriculture Henry A. Wallace, on April 13, announced that he has adopted a new regulation applicable to the management of the National Forests which gives the Forest Service authority to control hunting and fishing and general management of game on National Forest areas when in the Secretary's judgment action by the government is necessary to preserve wildlife and to coordinate game management with other uses of the public forests. The regulation is of nationwide significance in that it virtually asserts the right of the Federal Government to control game on its own lands when public interests and balanced forest management demand. Heretofore game administration in America has proceeded on the theory that all wildlife belongs to the state irrespective of who owns the land. The control of hunting and fishing has been left to the states, with the Federal Government following the policy of cooperating with state agencies in the management of game on the National Forests.

Under the new regulation, it is stated, the cooperative principle will be continued by the Forest Service and the application of direct management on specified National Forest areas will be made only where state or other agencies are failing to carry out adequate measures of game management. The instructions accompanying the regulation specify that it is to be applied in each case only after approval by the Secretary of Agriculture and upon a showing of facts by the Regional Forester and the Chief Forester that the control action by the Federal Government is necessary to effect proper management of wildlife and other resources of the National Forests.

It was stated at the Forest Service that the new regulation will probably be first applied to areas in the National Forests which the Biological Survey consider essential as permanent sanctuaries in the successful administration of the Migratory Bird Treaty Act. Asked as to the position of the Forest Service in the event the states oppose application of the regulation to any area, officials stated that a test case would probably have to be taken into the courts for determination of the legal right of the Federal Government to exercise control of game on National Forest land.

The regulation is based upon the following premise: (1) That wildlife is one of the major resources of National Forest land and water and that its management and development are an essential part of the administration of the National Forests; (2) that prevention of overgrazing and erosion and the protection of other resources of the forest are often dependent upon the regulation of wildlife population to the carrying capacity of the land or water; (3) that the most effective means of regulating wildlife population to the carrying capacity of the range or water is by regulated hunting and fishing carried out on the principle of removing excess numbers annually or periodically; (4) that regulation of hunting and fishing on the National Forests is effective in reducing forest fire hazards and in promoting the conservation of our National Forest resources, and (5) that wildlife management, including the regulation of hunting and fishing, should be closely harmonized with the plans and objectives for the management of other National Forest resources to insure maximum public benefits.

As promulgated by the Secretary, the regulation reads as follows: "REG. G-20 A. When the Secretary shall determine upon consideration of data and recommendations of the Forester that the regulation or the prohibition for a specified period of hunting and fishing upon any National Forest or portion thereof is necessary for the accomplishment of the purposes above set forth, he shall designate such National Forest or portion thereof, establish hunting and fishing seasons therefor, fix bag and creel limits, specify the sex of animals to be killed, fix the fees to be paid for permits, designate the authorized official to whom application for permit shall be made, and describe the terms and conditions under which hunting and fishing shall be conducted with a view of carrying out the purpose of this regulation. Public notice of such designation shall be given by such means as the Forester shall deem adequate for the purpose. Carcasses of animals or fish taken under permit shall be marked or tagged for identification as directed by the Forester.

"REG. T-8½. Upon National Forest lands designated under Reg. G-20 A the following acts are prohibited:

"Hunting, trapping, catching, disturbing, or killing any kind of game or non-game animal, or game or non-game bird, or taking the eggs of any such bird, except during hunting and fishing seasons established by the Secretary, and in accordance with the terms and conditions of a permit issued by a duly authorized officer which is valid and subsisting at the time."

According to the Forest Service the regulation is devised in order to permit it to redeem the administrative responsibilities imposed on it by Congress in making all National Forest lands fully productive on areas or streams where cooperation has failed because of a failure on the part of cooperators to accept and apply the recommendations of the Forest Service made after painstaking study and investigation over a period of years. The application will be applied, it is stated, only in cases where repeated efforts have failed to work out on the ground adjustments in hunting and fishing practices which are depleting the wildlife or other resources.

Pointing out that the National Forests furnish the principal part of the range required by the big game animals of the West and a smaller part of wildlife range in other regions, F. A. Silcox, Chief Forester, stated. "That all land should be devoted to its most productive use is a principle which has guided Forest Service policy for twenty-nine years. This principle has been applied to range primarily adapted to wildlife and land use plans developed accordingly. That its application has proved sound is indicated by the large increase in big game animals on the National Forests during the past ten years. That there is still room for much improvement is indicated by numerous areas supporting only a relatively small proportion of the wildlife the areas are capable of supporting, and by the other large areas where the population of wildlife is in excess of the carrying capacity of the land. To overcome these conditions the wildlife crop must be coordinated with other essential uses and managed on a sustained production basis. To do that, regulations must be developed and applied which recognize the problems involved on each area or stream."

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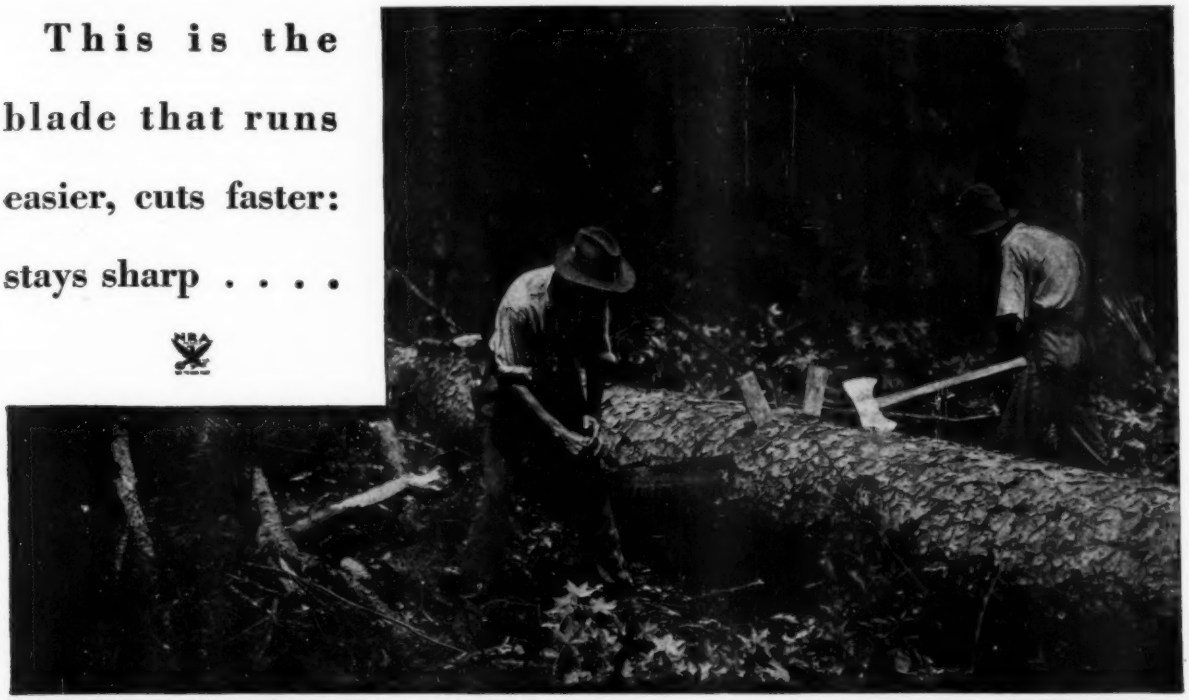

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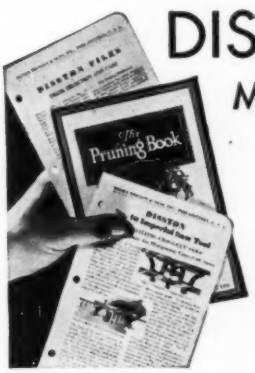

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SHOVELS—brooms—sticks. Poor things for fighting a raging brush fire! The five men are doing their best to get the blaze under control—but if *just one* of them had an INDIAN FIRE PUMP their job would soon be over. Don't take a chance with fire! Write us today for prices and full details on our complete fire pump line and be prepared for any emergency.

We Have Supplied Thousands of INDIAN FIRE PUMPS for use in Government C. C. C. Camps

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FORM-FITTING, VENTILATED TANK GIVES A CONSTANT CIRCULATION OF AIR BETWEEN TANK AND CARRIER'S BACK. IT PROTECTS THE BACK FROM THE COLD WATER AND MOISTURE IN THE TANK AND KEEPS THE BACK WARM AND DRY. THE FORM-FITTING SHAPE OF THIS TANK FITS THE BACK PERFECTLY. SNUG AND FIRM AND FEELS GOOD.

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I HAVE PURCHASED SEED STOCKS AND LEASED THE FOREST NURSERIES OF

The Long-Bell Lumber Company

and shall continue to collect all Pacific Coast and Gulf States conifers and to grow planting stock for the Forester and the Nurseryman.

Site and Climatological Data Supplied
Special Collections Made by Arrangement

JOHN B. WOODS, FORESTER - LONGVIEW, WASH.

Fishing and Hunting Areas Extended in Adirondacks

Approximately eighteen thousand acres of additional territory have been opened up in the Adirondacks for hunting and fishing during the open season this year, according to an announcement made last month by Conservation Commissioner Osborne, of the New York State Conservation Department. Mr. Osborne announced that he had revoked orders which had established the Saranac Lake, Racquette Lake, Minerva and Arietta Game Refuges, all within the Adirondack Preserve, and that these tracts will now be open to the public for hunting and fishing.

The areas have been closed since 1928. "Now we are throwing them open to the public," said Mr. Osborne, "and we feel certain that the hunters and fishermen will find much game and a number of fine streams in which there are some pretty nice sized trout. It is all state owned land and can be reached without any great inconvenience."

Pennsylvania Plans to Plant

The largest individual tree planting operation ever undertaken in Pennsylvania is scheduled for this spring at the 16,000-acre Pymatuning reservoir in Crawford County, construction of which was begun in October, 1931, and is now nearing completion, Secretary Lewis E. Staley of the Department of Forests and Waters announces.

One million trees will be set out on the State-owned property surrounding the reservoir site. The reforestation project is under the direct supervision of Ralph J. Ferris, field engineer of the Department of Forests and Waters, with headquarters at Linesville. The trees to be planted are Norway and white spruce; white, red and pitch pine; Scotch pine and Japanese larch.

George H. Wirt, director of the Bureau of Forest Protection, reports that 1933 was the most successful in forest fire control in Pennsylvania in the history of the Department of Forests and Waters.

The total number of fires that burned in the woodlands of the State was 1,800, and the area burned did not exceed 25,000 acres. Damage to woodland and other propety as a result of these fires has been estimated at $65,000. To extinguish these fires the Commonwealth paid in labor charges $36,388.

New Lakes for Palisades

Through the labors of the C.C.C. a half dozen or more new lakes are being constructed in the Harriman section of the Palisades Interstate Park in the Highlands of the Hudson and northern Ramapos. These lakes will add several hundred acres of water to the park for aquatic recreation and sport and for reservoirs.

According to Major W. A. Welch, Manager of the Park, the unsightly appearance of the lake sites during construction has caused some alarm lest the beauty of the park is being destroyed. "But let them wait a few months," declares Major Welch, "and these complainers will be pleased at the transformation when the depressions fill up to the high flow lines and shining blue lakes take the place of the present apparent marring of the scenery." The C.C.C. boys, Major Welch further states, are but restoring conditions that existed some thousands of years ago when glacial ice covered the region and formed the depressions. The depressions selected for the lakes now being constructed were marked twenty years ago by Major Welch as suitable for damming into lakes as the demand for shore lines for camping increased.

Epochal Events In FORESTRY

★ ★

On March 23, 1934, President Roosevelt approved the Forest Conservation Code. It will become effective June 1, 1934. The forest industries of America, working under the provisions of the Lumber Code, in close association with public agencies, have adopted this plan to accomplish conservation and sustained production of forest resources.

HENCEFORTH, voluntarily, the forest industries will apply to all operations the best practicable rules of forest management. These are:

1. Fire protection during and immediately following logging.
2. Cooperation with States and Federal agencies in continuous protection of forests against fire, insects and disease.
3. Conservation of immature trees and young growth.
4. Provision for restocking land after logging.

As rapidly as possible, with the aid of public agencies, the forest industries will move toward general adoption of:

5. Partial cutting or selective logging.
6. Formulation of individual management plans.
7. Development of sustained yield forest units.

IT is agreed that this national plan of private forestry calls upon the States and the Federal Government for public action for forest protection, forest credits, forest taxation reform, public forest acquisition and forest research.

Granted nation-wide support of the public program, we shall achieve the establishment of private forestry on a scale unparalleled in history.

WE ASK THE AID OF ALL FOREST-MINDED PEOPLE TO SECURE THIS PROMISED PUBLIC SUPPORT, SO THAT PRIVATE FORESTRY SHALL SUCCEED.

National Lumber Manufacturers Association

1337 Connecticut Avenue Washington, D. C.

Administrative Agency Forestry Provisions Lumber Code

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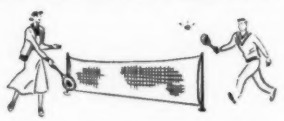
Spring Song
IS A
Surf Song

With our lazy Sun Decks as first balcony, the sea for a stage, and a backdrop of clear, blue sky, the breakers are putting on a continuous show for all our spring guests. In addition, to every one attending the performance we offer a complete program for a bang-up spring holiday. • With the beach at our door,

and game rooms, squash courts, dances, music and varied entertainments right here in the hotels, you'll have no time for boredom. Outside there's golf, tennis, riding, and a Boardwalk lined with fascinating shops. • If, on the other hand, you prefer relaxation, we know of no pleasanter ways to find it than basking in the salted sunshine on our broad Ocean Decks, effacing fatigue in our modern health baths, or sinking into profound sleep at night to the rhythm of the sounding surf. . . . And our chef has a way with food that is wonderfully re-



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ATLANTIC CITY

Woods to Represent Lumber Industry

John B. Woods, for many years forester for the Long-Bell Lumber Company, with headquarters at Longview, Washington, has been selected by the Lumber Code Authority and the National Lumber Manufacturers Association to be its representative in the development and administration of the forestry program which the industry has made obligatory upon itself by the recent adoption of amendments to Article X of its Lumber Code. These amendments, which are given in full on page 214, call for the initiation not later than June 1, 1934, of woods practices designed to promote conservation and the sustained yield of forest resources.

JOHN B. WOODS, FORESTER

Who will represent the lumber industry in the development and administration of the forestry program under the Lumber Code Authority.

Mr. Woods assumed the duties of his office in Washington late in March. "The forest industries' Conservation Code," Mr. Woods declared, "aims at practical forestry which will sustain and improve our forest resources. Self government in forestry is just as feasible as in the other activities under the Lumber Code, and its beneficial results can scarcely be overestimated. It is gratifying to find that the various divisional committees on conservation have promptly taken up their work of formulating rules of forest practice. We fully expect to be in readiness for active forestry administration by June 1. We are confident that the public part of the reforestation program, agreed upon by the Forestry Conference —which awaits President Roosevelt's approval and initiation—will not be allowed to lag behind that of the industry."

Mr. Woods is a forester of national and international experience. During the War he was a member of the Tenth Engineers, and left the service at the conclusion of hostilities with the rank of Captain. After a period as Assistant State Forester for Massachusetts, he was selected by the Treasury Department as a timber valuation engineer. In 1923 he became forester for the Long-Bell Lumber Company and placed in charge of its work in developing forestry in connection with its large timber land holdings in the South and Pacific Northwest.

Army Develops Civilian Supervision of C.C.C. Camps

Less Army and more civilian supervision will mark the third period of the Civilian Conservation Corps which began April 1. Although the War Department will continue to have general charge and management of the Corps, it is following the policy of rapidly relieving regular Army officers from camp details and placing each camp on a civilian basis in so far as possible. Already regular Army officers have been withdrawn as camp commanders and their places taken by reserve officers; likewise enlisted men in the Army are being released and their places filled by men picked from the camp personnel, thus placing each camp virtually on a civilian basis except for the reserve officer in charge.

General supervision of the Corps by the War Department through its Corps area and district commanders will, however, continue, but the set-up for each camp contemplates a reserve officer as camp commander and the filling of all other local administrative and supervisory places from the ranks of the C.C.C. enrollees and civilians employed because of their specialized knowledge and experience in the lines of work radiating from the camps. This policy naturally enlarges the opportunities for enrollees to obtain better paid positions than the thirty dollars a month grade and tends to bring out and develop special abilities of the different men for leadership and administrative or supervisory direction. At the present time approximately 3600 reserve officers have been assigned to the camps to relieve officers of the regular Army. The camp supervisory positions number approximately 1400 and these have largely been filled by civilians.

On April 1, the close of the second period and the beginning of the third period, the ranks of the Corps were opened to 116,000

recruits to fill the gap made by those who voluntarily withdrew or were discharged at the close of the second period. This reduced the total number of enrollees to approximately 180,000. It was anticipated that the new men would be enrolled speedily during April and that before May 1 the full strength of the Corps, namely 300,000, would be reached. As reported last month, there will be an infiltration of new men into the camps throughout the next year because of the policy adopted of limiting each man's enrollment to not to exceed one year.

Of the new men admitted to the Corps during the month, provision was made for 28,000 veterans and approximately 25,000 men selected because of previous woods experience. The remaining 160,000 will be largely inexperienced boys between the ages of eighteen and twenty-five. Beginning the latter part of April and extending through May there will be a general movement of the Corps throughout the United States to summer camps from which work during the next six months will be performed. A total of 1468 camps have been located and where vacating present camp sites are called for, the movement will begin just as soon as local weather conditions permit. Every effort is being made to start the summer program of work at the earliest possible date.

Forest Service Establishes New Forest Region

The Forest Service has announced that, effective July 1 next, a new National Forest Region will be established by division of Region 7, which now embraces all states containing National Forests in the eastern and southern parts of the country.

The new region will be known as Region 8 and will embrace all the states south of and including Tennessee and North Carolina and extending west to include Texas and eastern Oklahoma. The headquarters of the region will be in Atlanta, Georgia, and the Regional Forester will be Joseph C. Kircher, who has been in charge of the eastern National Forest work for the past several years. Alaska, which is now known as Region 8, becomes Region 10.

The region embracing the New England states, New York, New Jersey, Pennsylvania, Kentucky, Virginia and West Virginia will form a separate district to be known as Region 7. Headquarters will be at Washington, D. C., and R. M. Evans, who has been Assistant Regional Forester in charge of forest management, has been designated as Regional Forester.

In connection with this action, Secretary Wallace has approved the two new regions handling directly the Clarke-McNary fire cooperation work, which heretofore has been centered in the Washington office.

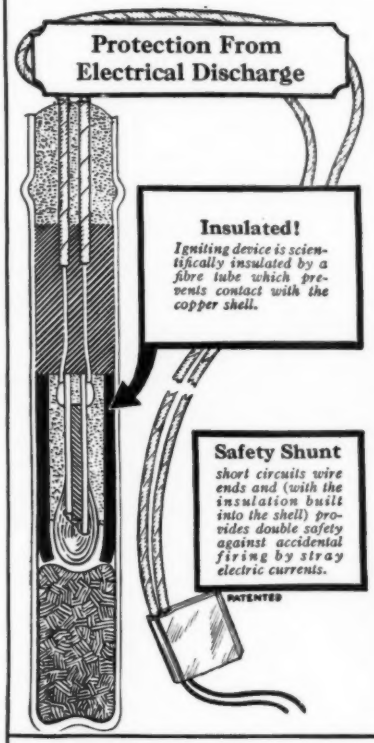
Indiana Obtains New State Forest

Through the generosity of residents of Dubois County, Indiana, the State has recently acquired eight hundred acres in Dubois County as a State Forest. The land is the gift of local residents, and the area it is expected will be enlarged by further donations on the part of sponsors of the project.

The area is largely covered with white, red and black oak, tulip poplar, elm, walnut, hickory, maple and beech. Administration and development of the area will be under the Division of Forestry, and with the aid of a C.C.C. camp it is planned to develop a twenty acre lake on the property, to plant a quarter of a million trees, to construct necessary road and to stock the land with wildlife.

SAFE!

Protection From Electrical Discharge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short circuits wire ends and (with the insulation built into the shell) provides double safety against accidental firing by stray electric currents.
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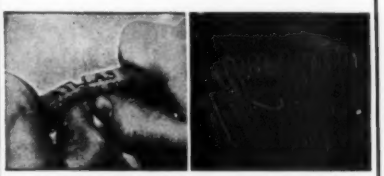
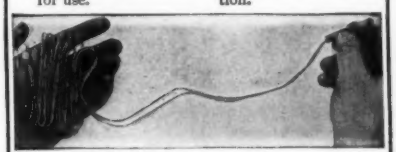


Simple pressure of the fingers breaks package open along indented line—and cap is ready for use.

The wires are kept folded accordion-wise so that they extend naturally into position.



It is easy to straighten out the cap end for priming without disturbing the rest of the accordion fold.

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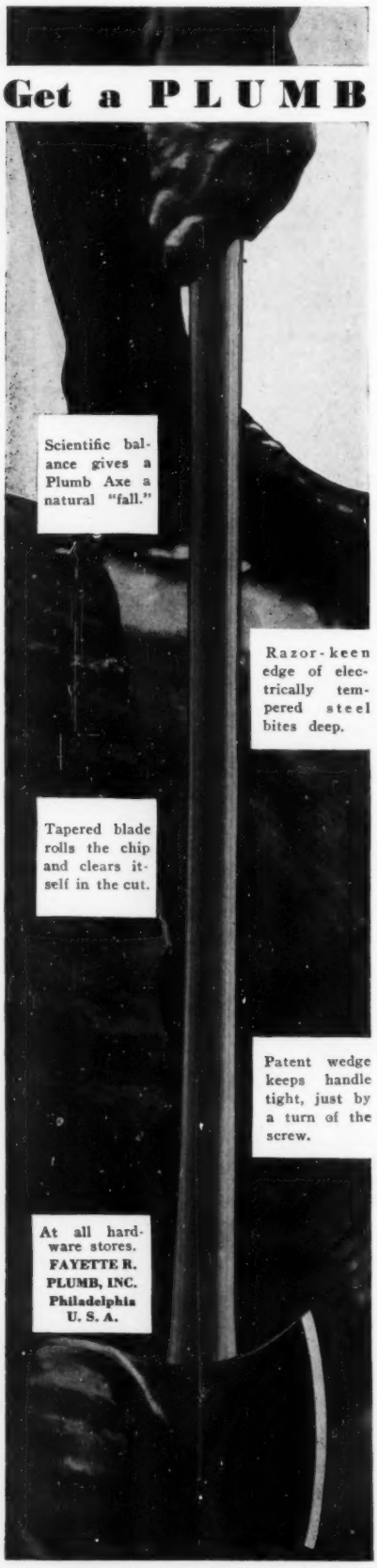
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Conservation Calendar in Congress

Published monthly while Congress is in session as a service to the members of The American Forestry Association. This Calendar contains bills introduced at the Second Session of the Seventy-third Congress from March 14 to April 10 inclusive. Whenever acted upon, previously listed bills are described in the Calendar; otherwise they may be considered as in the same status as when last printed.

BILLS APPROVED

H. R. 8134—SANDLIN—Appropriations for Agricultural Department for 1935. Approved March 26. Public Law No. 131.

H. R. 5632—KLEBERG—(S. 2633—WALCOTT)—"Duck Stamp Bill." Approved March 16. Public Law No. 124.

Senate Resolution 205—HALE—To request the Secretary of Agriculture to report on information concerning pulpwood and paper and its relation to forest conservation. Passed March 15.

H. R. 7513—OLIVER OF ALABAMA—Appropriations for the Department of State and Justice and for the judiciary, and for the Departments of Commerce and Labor, for 1935. Passed House and Senate. Senate agreed to House amendments March 27. Approved April 7. Public Law No. 143.

NATIONAL FORESTS

S. 1982—MCNARY—(H. R. 6202—MARTIN OF OREGON) Mount Hood National Forest Lands. To Agriculture and Forestry. February 7. Report No. 269. Passed Senate February 20. To House Committee on Public Lands. Report No. 1021. March 19.

S. 2876—HATCH—(H. R. 7975—HOWARD)—To transfer national-forest lands to the Zuni Reservation in New Mexico. Report No. 463. March 10. Passed Senate March 20. To House Committee on Indian Affairs.

S. 2924—MCNARY—To include within the Deschutes National Forest in Oregon certain public lands within the exchange boundaries thereof. Report No. 545. March 23. Passed Senate March 29.

S. 3113—MCNARY—(H. R. 8640—PIERCE—Introduced March 14)—To add certain lands to the Malheur National Forest in Oregon. Introduced March 20.

S. 1506—STEIWER—To amend the United States mining laws applicable to the Mount Hood National Forest in Oregon. Report 267. Passed Senate February 20. Reported from House Committee on Public Lands. March 15. Report No. 984.

S. 1983—MCNARY—To revise boundaries of Fremont National Forest. Passed Senate February 20. Passed House in lieu of H. R. 4934, April 5.

H. R. 2858—TAYLOR of Colorado—To add certain lands to the Pike National Forest, Colorado. Report No. 988. March 16.

H. R. 2862—TAYLOR of Colorado—To add certain lands to the Cochetopa National Forest, Colorado. Report No. 989. March 16.

H. R. 3206—MARTIN of Colorado—To exchange lands adjacent to National Forests in Colorado. Report No. 994. March 17.

H. R. 7927—WHITE—(S. 4497—BORAH)—To add certain lands to Boise National Forest. Report No. 1141. April 4.

H. R. 7425—WHITE—(S. 2795—BORAH)—To include certain lands in the National Forests in Idaho. Report No. 981. March 15. Passed House April 5.

H. R. 8697—MOTT—(S. 3007—MCNARY. Report No. 595. April 4)—To authorize addition of public lands to the Willamette National Forest, Oregon. Introduced March 17. To Agriculture.

H. R. 5368—MARTIN of Colorado—To extend the provisions of the Forest Exchange Act of March 20, 1922. Report No. 995. March 17.

S. 2647—ASHURST (H. R. 8730—SUMNERS of Texas)—Prescribing the procedure in condemnation proceedings brought by the Federal Government for land being acquired for public use. Report No. 502. March 19.

NATIONAL PARKS

H. R. 4935—CARY (S. 618—LOGAN—Report No. 594. April 4.)—To amend the act of May 25, 1926, establishing the Mammoth Cave National Park in Kentucky. Report 983. March 15.

H. R. 7200—MCREYNOLDS (S. 2440—BACHMAN—Report 620. April 5)—To add certain lands to the Chicamauga and Chattanooga National Military Park in Tennessee and Georgia. Report No. 999. March 17. Passed House April 5.

H. R. 8698—SISSON—To provide for the establishment of a National Park or monument at Fort Stanwix, New York. Introduced March 17.

H. R. 8625—FERNANDEZ—To add certain lands to the Chalmette National Monument in Louisiana. Introduced March 13. To Public Lands.

H. R. 7982—LEWIS of Maryland (S. 3239—TYDINGS)—To establish a national military park at the battlefield of Monocacy, Maryland. Report No. 1134. April 3.

H. R. 7360—WEAVER—To establish a minimum area for the Great Smoky Mountains National Park. Report No. 982. March 15.

H. R. 8718—RANKIN—To provide for commemorating the two hundredth anniversary of the Battle of Ackia, Mississippi, and the establishment of the Ackia Battleground National Monument. Introduced March 19.

INDIAN AFFAIRS

S. 1888—WHEELER—(H. R. 5871—HOWARD) To provide for protection and conservation of grazing resources of the undisposed of ceded Indian lands. Report 381. Passed Senate March 15. House Report 1099. March 28.

S. 1889—WHEELER—To facilitate a more economical administration of forest and grazing lands on Indian reservations. Report 382. Passed Senate March 15. House Report 1100. March 28.

WILD LIFE

S. 2934—SMITH—To facilitate the acquisition of migratory-bird refuges. Report No. 547. Passed Senate March 29.

STATE PARKS

H. R. 5927—COLLINS of California— Report No. 991. Passed House April 5.

(S. 3103—JOHNSON)—To provide for the selection of certain lands in California for the use of the California State Park system.

H. R. 4349—LEA of California—To withdraw certain public lands from settlement and entry, for a local park in California. Report No. 985. March 15.

Forest Genetics Institute Receives Federal Aid

Continuation of the work of the Institute of Forest Genetics at Placerville, California, by an allotment of Public Works funds amounting to $40,000 assures the maintenance of the Institute until regular appropriations can be secured under an Agricultural Appropriation Act.

The Institute of Forest Genetics was established in the spring of 1925 by James G. Eddy of Everett, Washington, and has been under the direction of Dr. Lloyd Austin since the beginning. The tract of sixty-five acres, located at an elevation of 2,700 feet in the Central Sierra, is the site of a unique effort to improve forest crops by selection of the best strains and by cross breeding. Much work has been with pines, but the program has been expanded to include other trees.

National Forest Purchase Program Expanded

Purchase of 154,420 acres within National Forest areas was approved by the National Forest Reservation Commission at a meeting on March 26, together with the establishment of thirteen new National Forest purchase units and the enlargement of thirteen existing units in ten states east of the Great Plains.

The lands purchased lie chiefly within National Forests in the Lake States, the Appalachian region and in the Ozark, central Mississippi and central pine regions. The average price was $2.97 an acre. The total area thus far purchased with the $20,000,000 made available last July by President Roosevelt is 3,233,862 acres, while the entire area purchased by the National Forest Reservation Commission since its establishment in 1911 now amounts to 7,766,560 acres.

The new purchase units include four in the eastern Texas southern pine belt comprising a gross area of 1,400,000 acres to be known as the Angelina, Davy Crockett, Sam Houston and Sabine National Forest units. These areas, approved by State Forester E. O. Seicke, mark the entrance of the Federal Government into large land ownership in Texas. This was made possible by the passage of a legislative act of May, 1933, permitting Federal purchases for National Forests.

Other new purchase areas are authorized in Missouri, North Carolina, South Carolina, Mississippi and Puerto Rico.

Of particular interest is a southern extension of the Cumberland National Forest Unit in Kentucky adding 379,000 acres which completely surround the famous Cumberland Falls, which in 1931 were acquired by the State of Kentucky as a state park.

Twenty-Two Tons of Locust Seed

Contracts for immediate delivery of 44,000 pounds of black locust seed at an average price of thirty-two and one-half cents a pound were let by the Department of Agriculture to Herbst Brothers of New York City on April 4. The seed will be imported from Europe and will be divided among ten State Nurseries. In the fall the seedlings will be transplanted on erosion control projects of the Civilian Conservation Corps in the middle west and south. Reports indicate that each pound of seed will produce approximately 25,000 locust seedlings, suitable for planting. Plans have been made for planting approximately fifteen million black locust seedlings next fall in Illinois, five million in Iowa and large numbers in Ohio, Indiana, Kansas, Tennessee, Kentucky, Missouri, Louisiana, Texas, Oklahoma, South Dakota and Utah.

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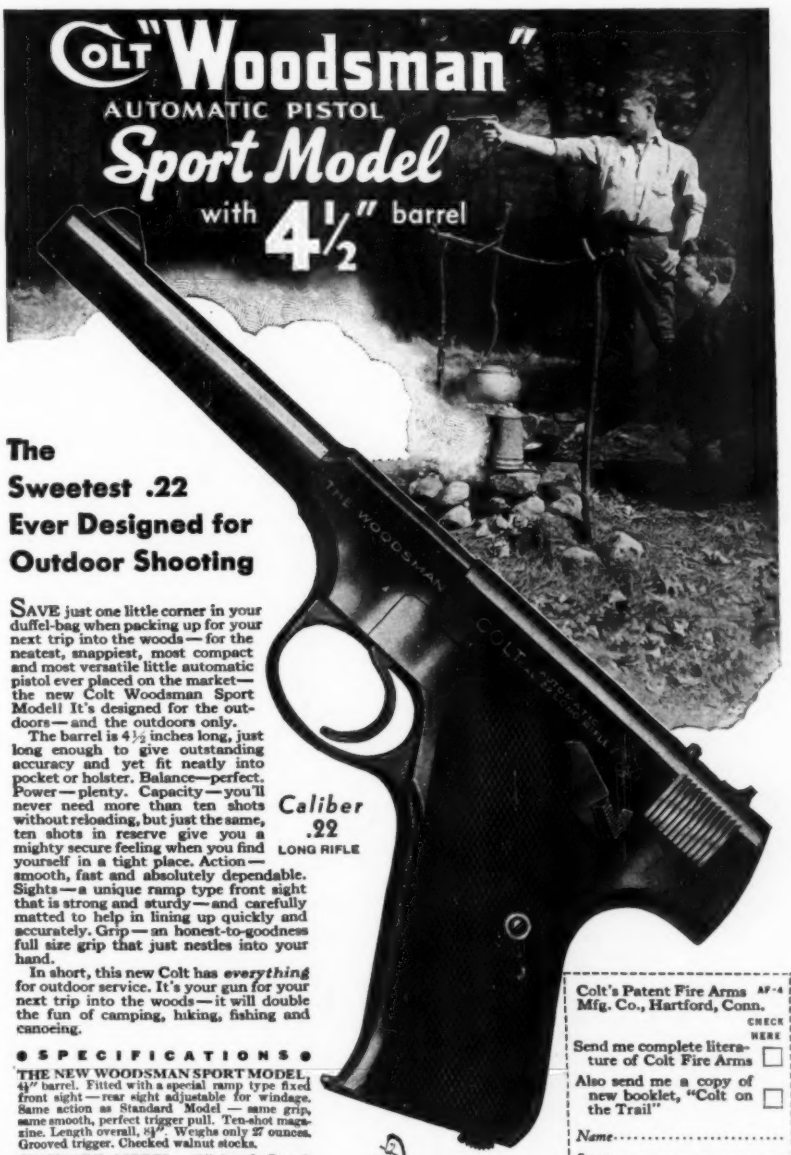
AUTOMATIC PISTOL
Sport Model
with 4½" barrel



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The barrel is 4½ inches long, just long enough to give outstanding accuracy and yet fit neatly into pocket or holster. Balance — perfect. Power — plenty. Capacity — you'll never need more than ten shots without reloading, but just the same, ten shots in reserve give you a mighty secure feeling when you find yourself in a tight place. Action — smooth, fast and absolutely dependable. Sights — a unique ramp type front sight that is strong and sturdy — and carefully matted to help in lining up quickly and accurately. Grip — an honest-to-goodness full size grip that just nestles into your hand.

In short, this new Colt has *everything* for outdoor service. It's your gun for your next trip into the woods — it will double the fun of camping, hiking, fishing and canoeing.

Caliber .22 LONG RIFLE

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THE NEW WOODSMAN SPORT MODEL, 4½" barrel. Fitted with a special ramp type fixed front sight — rear sight adjustable for windage. Same action as Standard Model — same grip, same smooth, perfect trigger pull. Ten-shot magazine. Length overall, 8½". Weighs only 27 ounces. Grooved trigger. Checked walnut stocks.

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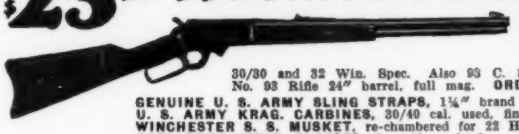

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FORESTRY IN CONGRESS

HOUSE PASSES PUBLIC LANDS BILL

By G. H. COLLINGWOOD

Conservation of the public lands of the United States, which has been a recurrent issue in and out of Congress for many years, was measurably advanced on April 11 when the House passed the Taylor bill to control grazing and soil erosion and to provide for orderly use, improvement and development of the Public Domain. Endorsed by President Roosevelt and the Secretaries of Agriculture and Interior, the bill was passed by a vote of 265-92 after three hours of debate, during which opposition to the measure was led by Representatives Englebright of California, Carter of Wyoming and Rich of Pennsylvania. The legislation now awaits action by the Senate for final approval.

The bill as passed by the House gives authority to the Secretary of the Interior to establish grazing districts in the 173 million acres of unreserved public land, to make such rules and regulations as he may deem necessary to regulate their occupancy and use and to issue permits to settlers and stock owners for the privilege of grazing livestock upon the established grazing districts under a system of grazing fees to be determined by the Secretary. These fees are to go into the treasury of the United States and upon specific appropriation by Congress are to be distributed, at the end of each fiscal year, twenty-five per cent to the Department of the Interior for expenditure in improving the lands and fifty per cent to the states in which the grazing districts are situated. The remaining twenty-five per cent is retained by the Federal Government as miscellaneous receipts. A limited amount of free grazing is permitted local residents for domestic stock.

The bill would abolish the application of the old 160-acre homestead law and the more recent 640-acre grazing homestead act to lands within the grazing districts and make these lands available to homesteading only after the Secretary of the Interior has determined by examination and classification that they are more valuable for agricultural crops than native grasses and forage plants. Where they are so determined, the Secretary is authorized to open them to settlement in tracts not exceeding 320 acres in area.

Another section of the bill requires recognition of existing water and grazing rights on the Public Domain as established "by the local customs, laws and decisions of the courts." An amendment added on the floor of the House gives the President authority to add to the National Forests unappropriated public lands lying within watersheds forming part of a National Forest and similarly to take away from the Forests lands principally valuable for grazing and to place them in a grazing district.

Early action on the measure is anticipated in the Senate in view of President Roosevelt's expressed wish for passage of the legislation. Hearings, it is expected, will be called shortly by the Senate Committee on Public Lands and Surveys, of which Senator Wagner of New York is Chairman. Other members of the committee are Senators Erickson of Montana, Adams of Colorado, Cutting of New Mexico and O'Mahoney, and Carey of Wyoming.

Efforts to assure better protection of the country's forest resources against fire, insects and disease were partially rewarded on March 20 when Congress passed the Department of Agriculture appropriation bill carrying an increase of $150,000 for federal cooperation in preventing and fighting forest fires and by adding $50,000 for research and $150,000 for control of the Dutch elm disease. The bill further provides that $360,000 shall be available from Public Works monies for work necessary to the control of the gypsy and brown tail moths. No appropriations are provided for continued warfare on the white pine blister rust, but $940,000 of Public Works funds are specified in the President's budget message to be available during the coming fiscal year.

In an effort to forward the Fletcher-Wilcox bill, H. R. 3827, to establish a National Park in the Florida Everglades, the newly organized House Committee for the Conservation of Wildlife Resources held a public hearing on March 19. Representatives of The American Forestry Association, the National Parks Association, the Izaak Walton League, the Garden Clubs of America and the Association for the Advancement of Science, expressing their support of a National Park in the Everglades, raised objection to the bill as drawn on the grounds that its language does not assure adequate protection of the remarkable plant and animal life existing in this sub-tropical area. Following the hearing, proponents of the measure, including the National Park Service, reconciled the differences over the language in the bill by agreeing upon the following proposed amendment: "The said area or areas shall be permanently reserved as a wilderness, and no development of the project or plan for the entertainment of visitors shall be undertaken which will interfere with the preservation intact of the unique flora and fauna and the essential primitive natural condition now prevailing in this area." This is in line with a resolution adopted by the Directors of The American Forestry Association in 1930 supporting the proposed park contingent upon the preservation to the fullest possible degree of the wilderness character of the area. The authors of the bill and the chairman of the House Wildlife Committee have all expressed a willingness to accept it.

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Robert A. Long, Philanthropist and Leader of Lumber Industry, Dies

Robert A. Long

Robert A. Long, organizer of the Long-Bell Lumber Company and for many years a leader and philanthropist of the lumber industry, died at his home in Kansas City on March 15, following an operation. Although eighty-three years old at the time of his death, Mr. Long was still active in business as chairman of the board of directors of the Long-Bell Lumber Company, which has carried on large scale lumber operations in the South for almost half a century. A decade ago the company extended its operations into the Pacific Northwest, building the town of Longview, Washington, where the largest saw mill in the world is said to be now in operation.

Mr. Long was a man of deep religious faith and a leader and liberal giver in the Christian Church, of which he was a member. At the time of his death he was president of the American Christian Missionary Society, the Brotherhood of Disciples of Christ, the Christian Board of Publications, and a trustee of the Bible College of Missouri.

At one time Mr. Long was President of the National Lumber Manufacturers Association.

George W. Woodruff Dies

George W. Woodruff, Public Service Commissioner of Pennsylvania and first law officer of the United States Forest Service, died at Harrisburg, Pennsylvania, March 23, following an attack of pleurisy. Mr. Woodruff's life was intimately connected with the early history of forestry. Brought into the Forest Service by Gifford Pinchot in 1903, he, with the assistance of Philip Wells who died a few years ago, laid the legal ground work for many of the major conservation policies of the federal government, particularly those relating to the National Forests. Among these are the regulation of grazing and water power —two questions vigorously attacked as unconstitutional but finally upheld by the Supreme Court of the United States.

Mr. Woodruff left the Forest Service in 1909 to become Assistant Attorney General in the Interior Department under Secretary Garfield. The same year President Taft appointed him Federal District Judge of the Territory of Hawaii, but after a few months he returned to the United States on account of the health of his wife and took up the practice of law in Pennsylvania. Upon Mr. Pinchot's election as Governor of Pennsylvania in 1923, Mr. Woodruff was appointed Attorney General of the State. Declining the same position upon Governor Pinchot's second election, he consented to serve as a Public Service Commissioner.

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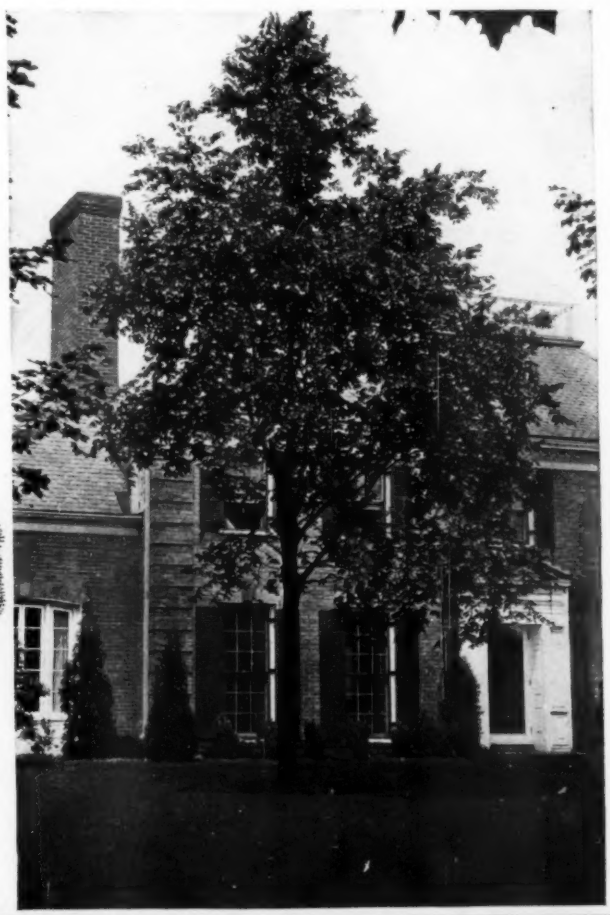

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TO ARMS FOR THE AMERICAN ELM

(*Continued from page* 199)

years afterward there was not a dead limb or twig upon it, nor any loose layer of bark. It was of the vase type, perfect in form. People came from long distances to hold picnics and celebrations under its towering height. There was no tradition of its age, for the tree stood alone in an open pasture, with no human habitation near it to carry its story, but certainly for more than a century and a half it had been the grand model of the American elm. Perhaps its successor in leadership and grandeur is now growing on the campus of some prairie college in the West.

All this might be written of many hundreds of American elms. But we can rejoice that before these Presidents of the forest were gone, the American people awoke to a consciousness of the splendor of their inheritance, and learned to plant and cherish them throughout the radius of their growth, and to sing the praises of their great trees as they do those of their great citizens.

As a shade, an ornamental and a monument tree, as a component of fine avenues for our cities, towns, villages, as a pilgrim of our parks, college campuses and country roads, the elm has moved steadily from east to west, and possessed itself of the land. Really indigenous to the greatest part of the country, it has adapted itself to regions where apparently it is not native. Once the special pride of New England and of the Hudson and Mohawk valleys, it has now passed into the use and affection of the people beyond the Mississippi. A few years ago the writer had an opportunity to witness an illustrative development in this westward march of the elm tree. Visiting in Topeka, the capital of Kansas, he noticed with pleasure many young elms growing by the side of the streets and in the parks and yards of residences. Calling on F. D. Coburn, the secretary of the State's Board of Agriculture, and a great influence in the State's agricultural and horticultural development—the man who made two bushels of corn grow in Kansas where only one grew before—the writer congratulated him on the appearance of the young elms on the city's streets.

"You are making Topeka a city of elms," I said.

Mr. Coburn smiled. "If you had seen what a job I had to get the first elm started here, you would indeed wonder now", he replied.

Coburn had emigrated to Kansas in an early day from southern Wisconsin, where he was born, and where the elm grows. He had brought one small elm after another to Topeka and planted it. No result! For a long time not one elm would grow in the unaccustomed habitat. He struggled on with them. From Whitewater, Wisconsin, he brought elm seeds and planted them carefully. No success! But at last a seed sprouted and took root. He nourished it. He had an elm! Then another and another. They took courage from one another—a principle of nature; as the Arab says, "the date tree, looking on the date tree, bears fruit."

"And now," said Coburn, "elms are growing like weeds all over Topeka and its neighborhood." They could indeed be seen springing up on the vacant lots. Among all the elms that now decorate the streets of the capital of Kansas, the old Pilgrims who dug up the little elms in the hinterland of Plymouth and planted them where some still stand, might see in the city the dutiful grandchild of the town they built in the wilderness as a shrine of faith.

This is the affirmative side, the triumphant side, of the history of the American elm. An invincible tree—that is what it has been. The farmer says, "You can't kill an elm tree. If you disturb the soil around a maple you may kill it; if you disturb the ground about an elm you increase its growth. The tree has had its pests, but it seems to have overcome them all. The beetle and the borer have attacked it—but leave it alone, it will come out all right."

That seems to have been, on the whole, its history. But now a deadly enemy has broken through its lines and threatens not only to destroy fine individual trees, but possibly wipe out the whole species. What an unspeakable calamity that would be! In the chestnut, we have had evidence of what happens when a useful tree—a whole species—is taken by disease from great sections of the continent. In the early years of this century the American chestnut in the neighborhood of New York was attacked by a fungus disease, introduced from Asia, which in two or three years killed each tree attacked. The disease rapidly spread over all the eastern states, until now but few chestnuts remain in northeastern America. I have said we started war on the chestnut blight too late. We were handicapped not only by a too late start but also by lack of knowledge of the life history of the blight, how it worked and how best to combat it. We were unprepared. Let us not repeat that mistake.

Grievous as the loss of the chestnut was, from an esthetic standpoint it was inferior to the calamity which a similar destruction of the elm would inflict. Imagine the wiping out of the beautiful avenues of elms that shade and decorate our streets and parks and roads, which stand in monumental grandeur at the doors of millions of homes, which constitute one of the greatest charms of our life! Without the elm the charm not only of New England but of great regions farther west and south, where the elms have become as much a matter of pride and joy as they ever were to the people of the Connecticut or Merrimac or Hudson valleys, would be lost. The destruction of our elms would be a bitter and calamitous loss.

Now is the time for all who would save the elm to take the measure of the Dutch elm disease and become scouts and soldiers in the war against it. For the disease is a ruthless enemy. First discovered in The Netherlands in 1919, here is what Mr. Curtis May, of the United States Bureau of Plant Industry, in 1930, eleven years after its discovery, said of its work in Holland:

"In Rotterdam there were something like 30,000 elms known, and of those 30,000, in the last eleven years, 17,000 have been cut down because they died from this disease. It is reported that Nuremberg had over 30,000 elms taken out since the disease appeared. Near Baarn, Holland, I saw a road of elms, approximately four miles long, planted double on both sides, being cut from one end to the other. All had died the previous summer from the Dutch elm disease. In the city of Baarn, where the Pathological Laboratory of the University of Utrecht is located, there used to be a large number of elm trees. I was told that only two elm trees were left in that town, and both these were infected."

From Holland, whence the disease received its name, it soon spread to Belgium, Germany, France, and England and caused widespread destruction of elms. It has also spread into Norway, a cool climate, and into northern Italy, a warm climate, indicating that weather conditions may be no barrier to its advances. It is believed that all species of the elm except the Chinese elm—most certainly European,

English and Northern American species—are susceptible to it.

The presence of the disease in America was first discovered in Cleveland and Cincinnati, Ohio, in 1930. In 1933 it was found in New Jersey and New York State around New York City where about 1,500 diseased trees had been found by the end of March, 1934. Two elms harboring the disease have also been discovered just across the line in Connecticut.

The Dutch elm disease like the chestnut blight is due to a fungus going by the name of *Graphium ulmi* Schwartz, which grows principally in the young sapwood of the elm and rapidly extends up and down the branches even down into the roots of the tree, causing its early death. The spread of the disease from tree to tree in the United States is by means of an elm bark beetle, *Scolytus multistriatus*, which carries the spores of the fungus and which plants them in the wounds made when it feeds on the twigs. Another related beetle, *Scolytus scolytus*, is also known to carry the disease in Europe but it is not known to have become established in America. The adult beetles emerge from the tree where they were hatched in the spring and fly to adjacent elm trees where they feed upon the young crotch wood, making short grooves in the bark and infecting the trees from the fungus spores which they carry. When the beetle is mature it selects a weakened elm tree in which to bore and lay its eggs. Feeding and egg-laying continue throughout the growing season although there seem to be two fairly distinct broods.

An elm infected with the disease soon shows certain well defined symptoms. "Usually the first symptom of the Dutch elm disease," says Dr. May, "is the sudden wilting of the leaves of a part of the crown of the tree, of the entire tree, or of the tips of some of the side branches. Drying of the leaves and defoliation of the affected parts may follow. The wilted leaves often turn yellow or brown before falling, and the affected parts stand out in color contrast with the rest of the tree. At times the wilted leaves remain green and crisp and cling to the twigs. The one or two end leaves frequently persist longer than the others, and the tips of the twigs bend, giving a characteristic appearance, which may be of value in detecting affected trees in winter. At Cleveland wilting appeared on all three of the trees in the latter part of May, but in England the trouble rarely is evident until June and frequently not until July or August. The progress of the disease on individual trees varies. One limb may wilt one year and others in succeeding years, or the whole tree may die in a single season. In all three of the cases in Cleveland the first wilting was followed in the same season by that of additional parts of the trees. On some affected trees the twig growth is short, the leaves fail to reach normal size, and the foliage is thin."

For effective warfare against the Dutch elm disease our men of science—plant pathologists and foresters—men under the authority of the United States Government, the state forestry and conservation departments, and the state and federal experiment stations, must be our shock troops. They are already on the battle line specializing in knowledge of the disease and methods of controlling and eradicating it.

What can we who are just plain citizens with the love of the tree in our blood do to help win this fight? First and foremost, we must be the soldiers behind the lines upholding the efforts of the specialists fighting to control and eradicate the disease. This means that we must do our part in seeing that the states and the federal government provide adequate finances for dealing with the enemy in an adequate way. The Congress of the United States has recognized its potential seriousness by appropriating last month $150,-

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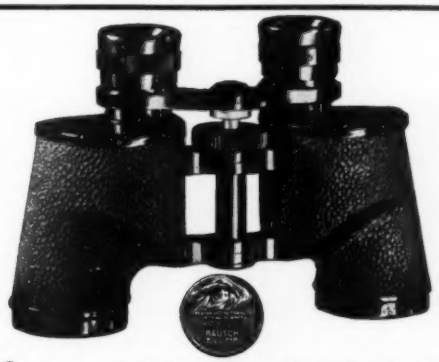

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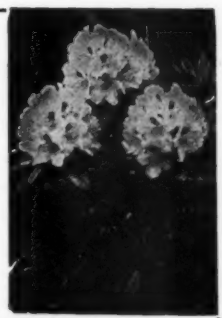

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000 for control work and $50,000 for research work. This sum is only one-fourth the amount the federal experts feel should be available for this season's essential work. Here is one place we may strike and strike hard by making it clear to our local Congressmen that the American public wants no penny-pinching in dealing with the disease in its incipient stage. By such a policy the cost may be increased manyfold and our elms may be lost to boot.

Another thing we soldiers for the elms can do behind the lines is to exercise eternal vigilance for symptoms of the disease and when we find them report them promptly to the nearest forest officer or experimental station. If neither is available, report them to the state forestry and conservation department. "Not every sick elm has the Dutch elm disease," caution the experts. "Watch your elms for *wilting leaves, or yellow leaves, or brown leaves* accompanied by brown streaks in the young wood. If you find this combination, send twigs the size of a lead pencil which show the brown streaks to the Dutch Elm Disease Laboratory, Care Agricultural Experiment Station, Wooster, Ohio. With the specimen send a statement of the exact location of the tree."

If you are the owner of elm trees here are some other things you can do that may prove to be wise precautions. Keep your trees in a healthy condition even though pathologists are not yet sure, or at least agreed, whether or not a healthy tree will withstand the attack of the Dutch elm disease better than an unhealthy tree. It seems reasonable to presume, however, that such is the case. The health of your elm trees can be helped by having dead limbs and thin live branches, if thickly grown, removed to allow for better circulation and ease in spraying against ordinary insects that attack and weaken the growth of the tree. Spraying with lead arsenate when leaves first show in the spring and again three weeks later will serve to control the insect pest peculiar to the elm. Proper care should be given to decayed cavities if they exist. If the tree is old and the soil in which it stands is impoverished, its health and strength will be improved by fertilization. In case of drought lack of normal water should be supplied.

In Europe investigators report that elms fifteen to forty years old are most subject to the Dutch elm disease, but whether this is true in America has not yet been established. The disease here has been found in at least fifty elms more than forty years old. Nevertheless, the younger trees will bear careful watching. But whether your trees are young or old, special vigilance should be exercised to detect promptly wilting, yellow, or brown leaves with brown streaks in the young wood. If this symptom is noted follow the instructions already given.

Whether we own elms or not let our watchword be "We have just begun to fight for the American Elm."

FROM THE DIARY OF A TRAIL RIDER

(*Continued from page* 215)

left and ahead—indeed the view will be unforgettable to us all. Far away shone the peaks of Glacier Park, before us the Continental Divide, and at the right the Chinese Wall. The South Fork Primitive Area, nearly 700,000 acres of wilderness, lay before us—and we were the first trail riders to penetrate into that area. The thrill of being pioneers!

We now knew that we would go home touched by the unadulterated beauty of nature, carrying in our hearts an unfading remembrance of happy unperturbed days full to the brim with impressions, thoughts and dreams, flowing out of an absolutely simple, almost primitive life.

Another thing we took very seriously. We had ridden in the morning through a region devastated by forest fires. While young trees were growing up almost to sufficient height to give us shade, the black trunks were rising against the sky for many miles, an accusation against the injustices of fate, a reproach to nature and man. At the Foolhen Fire Lookout, Sousley explained that the majority of fires were caused by lightning, but many others were started by a cigarette carelessly thrown away, by lighted matches, or by campfires not completely deadened. All of us understood, all of us felt a responsibility. After a fire it would take a century for the trees to grow to the height of the dstroyed forest.

It was a long way down the mountains to our night quarters at Danahar Creek—eighteen miles in all during the day. But what an eighteen miles! So far we had seen no animal life, but plenty of unknown flowers. On my way I counted forty-nine varieties, some which I had seen on European Alpine meadows; others, such as the high-growing, blooming bear-grass, were completely new to me.

In the valley the advance guard set the horses into a gallop—our first wild dash during the trip—and we reached camp near the South Fork of the Flathead River. Tired though we all were, and hot, we ran down for a swim, the entire group this time. Yes, we were a group by now. I have often wondered what force made these individuals, most of whom had not known one another a week—even a day ago, a well-rounded group. We had all come for different reasons, with different interests—some because of the scenery, others for the adventure, still others because they enjoyed sports, liked camping and outdoor life; a few in an attempt to escape from the artificiality of civilization into a simple, healthy, strong and beautiful life.

In the evening we again gathered around the fire and listened to Sousley's tales of wild animals and the Big Prairie district in winter. The next morning we divided into two groups, those with impatient natures or impatient horses riding ahead. A seventeen-mile ride that day on a very narrow path on the mountain slope following the bed of the green Flathead River below. Who can describe the impressions of that day? We crossed wide open grass-covered places with old, perfectly shaped pine trees here and there. The bark of these trees was of a burning orange-brown, as though the setting sun was gilding them; but it was midday and over the long pine needles streamed the sunshine.

We stopped three miles before camp to climb down to a spring for a drink, and reached the Big Prairie Ranger Station early in the afternoon. Scoop, a tall and strong man who seemed to personify good humor itself, stood in the doorway announcing that there was ice-cold lemonade for the weary riders. We were delighted! Here was a place in the middle of the wilderness with all conveniences of civilization—these same conveniences we had scorned a day ago. There were showers with hot and cold water and we took a thorough scrub; there was a kitchen.

Hutch and his son Bill went fishing. Apparently the fish were unaware of the danger of human beings with hooks, for in a short while they had caught sufficient trout for all of us for supper. That happy fate was with us day after day. It seemed to us as though we had never tasted more delicious fish. This evening, too, we sat around the fire, singing. Mr. Alderton's voice carried the tune; one of the rangers had a guitar. But soon we would

go to our bags, one after another. We had earned the sleep of the righteous.

The night brought new excitement. A coyote went hunting around the camp, circling particularly around the place where Walter slept. Coyotes never attack human beings, he remembered, but in the darkness of the night he did not feel convinced, so he uncovered his long army knife and laid it at his side, quickly recollecting what he had read in children's books about the method of killing wild animals. These were the stories told to me in the morning, for I, full of energy during the day, had slept through all the excitement.

Perhaps the ride of the next day was the most impressive of the entire trip. Walking and trotting our horses through completely silent, completely untouched pine forests, with the sun streaming through the branches, we were lost in keen enjoyment or in reverie. Unexpectedly we came upon Big Salmon Lake. Without a ripple, crystal clear, the lake lay before us reflecting the green mountains with regular precision and later, as we rode along, revealing the snow covered slopes at the other end. It was impossible not to take a mid-day swim in the lake. The water was cold, to be sure, but when you swam half-way across you could get a complete view of the white mountain range, and then you could get out into the warm sun for lunch—and for a nap if you wished.

Days passed, and then the last. Could it be? Would we meet automobiles today? Would that world beyond the mountains which had been a dim unreality during the past week claim us again? It was inconceivable and anyway, we were still on this side of the Divide. We climbed up in the shade of the tall fir trees, crossed Alpine meadows radiant with colors, had lunch at the edge of one of the small black lakes. Later we came upon rocky land without vegetation; snowfields again; upward, upward to Gordon Pass. At once, unexpected in its vastness, its greenness rolling off into the distance, there lay before us the valley. Lakes shone between the trees. We could see Holland Lake where we would have a dip, we could see further to Lindbergh Lake, where we would spend the night and beyond into the region through which we would travel to reach the railroad station. A last look back into the Flathead country, a farewell, and we descended.

But we did not as yet realize that it would soon be all in the past. The descent was exceedingly steep. One step to the side and horse and man might have slipped, slipped down 2,000 feet. The horses, they said, were sure-footed and knew their way. There was no reason for worry. At the bottom we were suddenly confronted with reality. Joe would leave us and take the horses with him. We shook hands with him, we bade farewell to Whitey—and stepped into an automobile to go to Captain Laird's.

Dinner at a table. We walked, two or three together, watching the evening fall. The group was no more. Here were persons whose business it was to take care of us, so we no longer felt the need of sticking together. We were now only a number of individuals. As the shadows drew over the lake and darkness followed, as the stars shone out above, Peggy thought of resurrecting the past and taking her sleeping bag into the open, but she too went into her cabin and enjoyed her bed. We met in the morning for a swim and drove off. Angela and Loretta tried to sing off the sadness which cast a shadow over our hearts, and we all joined in, but there was not the same unconcernedness and freshness in our voices.

THE COURTSHIP AND NESTING OF BIRDS

(*Continued from page* 217)

all nests escape destruction long enough for the young birds to leave of their own accord.

Birds use many means by which to evade their numerous enemies. They build their nests in inaccessible places, and in very inconspicuous spots, and they decorate them with bits of paper, cobwebs, and lichens. Many nests are built in deep shade among branches and twigs; others under stumps; and some in open fields.

The nesting materials are much the same for all birds of the same species. In general, house wrens use twigs, bluebirds use grass, yellow warblers use cotton, robins use grass and mud, barn or cliff swallows use mud, and the Baltimore orioles use vegetable fibers such as the inner bark of milkweed.

Birds seem to like bright materials, and will often desert their natural nesting materials for pieces of bright-colored yarn or cloth. But these bright colors endanger the nest which otherwise might be inconspicuous. So it is a bad practice to put out bright pieces of string and cloth with the idea of helping the birds during nesting periods. One wonders at their poor judgment in this respect, after seeing how carefully they try in other ways to conceal their nests. Perhaps this mistake is no worse than placing their nests in unusually dangerous places such as they often do, in locomotives, on hay-rakes, on automobile springs, and in lawn-mowers. Wrens have even been known to build nests in pockets of clothing hanging on a clothes-line.

Nests are of many sorts. The whip-poor-wills and night-hawks build no nest, but lay their eggs on the bare ground. The same is true of many sea birds. The kildeer and least tern merely scoop out a little depression on the ground to keep the eggs from rolling out, while meadowlarks and ovenbirds build elaborate nests on the ground. Other birds raise their nests above the ground and many place them in trees, while the most elaborate nests are probably those of the Baltimore orioles and weaver birds.

The time required for building the nest may be long or short. Robins, blackbirds and most other common birds require about six days. The time is divided about equally between the outside and the inside of the nest. If the nest should be destroyed just when the eggs are being laid, the same birds may replace the nest in a single day. The nest is usually completed the day before the first egg is laid.

The daintiest nest I have ever seen is that of the hummingbird. I have one in my study. It is mounted on a twig smaller than a lead pencil, has a cup-like interior lined with chestnut-burr down as fine as silk, and the outside is covered with bits of lichen bound on with cobwebs.

A few birds are communistic and build one nest in which several females all lay their eggs and then share the duties of incubation and rearing the young. This is true of several tropical birds, and our own swallows seem to lean toward this type of family life, although their nests are separate.

The cowbird does not build a nest, but lays her eggs in the nests of other birds such as sparrows, and leaves the hatching and rearing of the babies to the bird in whose nest the eggs are laid.

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A FOREST CREDIT SYSTEM

(*Continued from page* 204)

the function of the forest credit institution is to assist in restoring our forest wealth to a more important status in our national economy. The need of such restoration is clearly shown by official reports to Congress of the standing sawtimber in the United States at about the end of each of the three decades of the present century, as follows: 1910, 2,800 billion board feet (report of the then Department of Commerce and Labor, dated January 20, 1913); 1920, 2,215 billion board feet (report of the United States Forest Service dated June 1, 1920); 1930, 1,668 billion board feet (report of the United States Forest Service, submitted March 27, 1933).

Comparison of the saw-timber supply or growing stock, as shown by these three reports, shows a shrinkage of approximately 600 billion board feet between the years 1910 and 1920, and a further shrinkage of approximately 550 billion board feet during the decade 1920 to 1930. Since during the entire twenty years the stumpage actually cut varied in value from about $2 to $10 a thousand feet, with an average weighted value of probably about $3 or more a thousand, the shrinkage in value of the forest resources of the United States must have been in excess of three billion dollars. This figure is consistent with the opinion generally held in the earlier part of this period that the investment in forest resources and forest industries of the United States was approximately ten billion dollars. It is doubtful whether an aggregate value in excess of six billion dollars can be shown at the present time.

The most recent of the above reports (Copeland Report) sets forth a program for restoring the forest resources in which public acquisition and development of forests play a very large part. It is recognized, however, that great areas of the most productive and most accessible forest lands will remain in private ownership and that extensive developments and changes in forest management practice will be necessary therein. To assist in developing these private forests, an adequate forest credit system can be of enormous service. It should be capable of expansion during the next decade to provide credits to operators of continuous-yield forests to the extent of perhaps one billion dollars. Skilled administration and gradual placement, as warranted, of a substantial part or all of this credit to build up the stock of growing timber and promote its orderly utilization as portions of the stands reach maturity, can provide important additions to the declining tax bases of many thousands of rural communities. Such wealth under present conditions makes a tax contribution of from one and one-half to two per cent annually.

Much consideration has recently been given to the establishment and maintenance of industries in smaller communities. The forest products industries, due to the heavy nature of the raw materials and consequent savings in transport costs by manufacture near the source of supply, have always been among the most reliable as sources of rural employment and industry. Forests thus contribute importantly to rural industrial balance. Forestry and agriculture, providing sources of food, clothing, and shelter, can go far in providing for self-sustaining communities. These are, however, only a few of the basic values which an adequate forest credit institution should foster.

It is reasonable to expect that a united program of public and private action should rebuild the public and privately-owned forests and the forest industries to the point where they will maintain a stabilized investment value of not less than ten to twelve billion dollars, or in other words restore former values. There is no doubt that the forests and forest industries should constitute at least that much of the stable national wealth and that no less will suffice to meet the continuing demand on these resources. In terms of sawtimber growing stock this means restoration of the national supply to not less than 2,500 billion board feet. This, of course, does not necessarily involve a larger annual production of forest commodities. It does mean that quality of forest products depending on raw materials from large clear timber will be raised above the low standards now necessarily prevailing in regions of depleted growing stock.

In support of such a program of restoration of forest wealth it should be borne in mind, as recently pointed out by Chief Forester Silcox, that this is one of the few positive additions to the national wealth that are possible. Whether the rate of exhaustion of our various mineral resources is in each case slow or rapid there is no avoidance of the gradual decline in those resources. As to the man-made wealth of the United States, general recognition of its elusive nature has never been more complete than at the present. Obsolescence, due to changes in style, consumer preference, and industrial processes, as well as physical deterioration, depreciation, and other factors, conspire to destroy with marvelous rapidity buildings, factories, transportation facilities, and all other works of man. The surest forms of permanent wealth consist of the soil maintained in productive condition, as in the case of continuous production forests and their closely related water resources.

Some skepticism exists as to the utility of maintaining a supply of forest products. It is true that, with the completion of our pioneering period and the accumulation of buildings of various types, the use of wood has declined. The really astonishing thing, however, is that even though the source of supply for much of our timber is now at a distance of 2,000 to 3,000 miles from the consumer, the use of lumber and other forest products remains as widespread as it is. It is quite conceivable that a system of building construction and construction finance, together with the general impelling desire to keep as up-to-date in good houses as in automobiles and radios, may again increase the use of wood. The re-creation of adequate forest supplies closer to the consumer, with a consequent elimination of transportation and other distribution costs, would be even more important in enlarging the use of ordinary forest products.

It is also strictly true, even as to privately owned forests, that a building-up of growing stock, such as can be encouraged by the judicious use of credit, will make positive additions to the values of farms and other private properties bearing forests, beyond the values which come from the mere expectation of utilization of forest products therefrom. In other words, wherever human habitation exists in close contact with forests, the mere presence of fine timber growing under true forest conditions is an esthetic and general element of value of the first importance. A properly managed forest-credit institution will give service in directing attention to these facts in addition to its function of facilitating through skillfully administered credits the creation of such conditions. Any forest program that does not provide for such an institution will fall very short of being an adequate program.

MAKING WATER WALK IN THE TENNESSEE VALLEY

(*Continued from page* 202)

areas around the Lake referred to the C.C.C. as the "Citizens Conservatory Cooperation." When it was first learned that C.C.C. camps were to be established in the area, a hill farmer asked one of our erosion engineers: "Where are them boys coming from?" When told that they were being transferred from camps in Idaho and Montana, but had originally come from New York City and New Jersey, the farmer threw up his hands and exclaimed: "My Gawd! Furriners."

It is a tribute to all concerned that this feeling was soon dispelled and in its place there has developed a real spirit of cooperation and good fellowship, so that the notary's misinterpretation was not such a bad mistake after all. The boys, through their willingness to work and through the results of their early efforts, are now on most friendly relations with the people on whose land they are working.

When the C.C.C. boys came into the Norris Area the T.V.A. owned no property and all work had to be planned for private land which the T.V.A. hopes ultimately to purchase. Working contracts were drawn up, signed by the land owners in the presence of notaries. Only after this written permission was obtained was work undertaken. This procedure has kept several men busy getting contracts signed up ahead of the dam builders. Where for a time we had "to sell" the land owner on the value to him of erosion control, we now have many owners coming to the camps asking that their lands be signed up for control work. There are still a few conservative individuals whose lands are washing away at a rapid rate and who want no C.C.C. help. They advance interesting reasons. One negro farmer told us: "The Lawd has made them gullies and He must have need of them. I aims to keep 'em."

Our method of attack on these eroding fields, pastures and abandoned farm lands differs with each area, depending upon such factors as steepness of slope, size of drainage basin, type of soil, nature of existing vegetation; and in many cases, the kind of material close at hand. There is an erosion foreman in each camp, whose duty it is to survey and determine the area of each separate watershed, prepare a sketch map showing the location and size of all gullies, calculate the maximum run-off and then plan and locate where control measures are to be put and what type to use. In this work the foreman has the cooperation and help of the erosion engineers in the T.V.A. Forestry and Soil Erosion Division, who go over plans with him and help work out the procedure on the critically eroded areas. Each project is thus planned ahead of the work crews and in advance of the dam builders. With soils varying from sandy loams to clay and shale, and with slopes from nearly level to ninety per cent, it is not difficult to visualize the many possible variations and types of erosion with which we have to contend.

During the past fall and winter, work was concentrated on the construction of check dams to catch soil and to slow down the run-off. In addition brush matting was laid and staked in place in order to hold the soil from washing from bare spots where no vegetative cover existed. Four general types of check dams are being used: bag dams, brush dams, log and plank dams and dams built of rock either with or without the use of mortar. Burlap bags partially filled with top soil, over which is sprinkled a handful of grass seed, are used in the shallow troughs or washes where gullies soon would form. Brush dams are used in the shallow gullies already too deep for control through the use of bags. In deeper gullies, log dams or plank dams, not over five feet high, are used. Finally, toward the lower end of deep gullies, or where a permanent drainage will always exist, rock and rock mortar dams up to eight feet in height are built. In many cases the slopes are too steep to adopt the usual engineering rule of having the water from one dam back up to the apron or base of the dam next above. In order to reduce the number of dams otherwise required on such extremely steep slopes, intermediate dams are omitted and instead the gully banks are matted with brush or, in extreme cases, are paved with rock to prevent further cutting in the channel.

The C.C.C. boys have pitched in wholeheartedly, have learned how to handle a pick and shovel; they can now swing an ax and pull a cross-cut saw, and at check dam building they have shown wonderful results in helping to make the water "walk off." The "Furriners" may not have been quite as adept at handling tools as the local farm boys, but all work on an equal basis when it comes to building check dams. The record for one week's work for a camp runs well above 200 rock dams or at the rate of better than one dam a week for each man, and these dams average four feet to the wier notch with widths up to eight and ten feet. More than 10,600 rock dams had been constructed up to April 1. 9,700 log dams, 16,000 brush dams and 18,000 bag dams. In addition, more than 318,000 yards of brush matting have been staked down on badly galled spots. Anyone having an idea that these boys have not been working need only keep their eyes open as they drive along any of the highways between Cumberland Gap and LaFollette or Knoxville, or along any of the dirt roads in the "hinterland" and they will see tangible results of much hard labor. It is a pity that they cannot also see the keen but friendly rivalry which exists between crews and the splendid *esprit de corps* exhibited by all.

Building check dams, or "brakes" as the farmers call them, is only the first step in the concentrated attack on the gullies and eroding fields. Dams in themselves will not solve the problem and once their catch basins have filled up with silt they will no longer serve as complete erosion checkers. Their purpose is to check the rate of run-off and to hold the soil in check until a vegetative cover of grass, vines, shrubs and especially trees can be established. Much of this eroded and eroding land should never have been cleared and cultivated and the gullies now present show the fallacy of the type of land use employed on these steep slopes. Terraces might have helped hold the soil in place on some of the gentler slopes, but gentle slopes are in the minority in this region and even the terrace-minded agricultural engineer often has to admit that terracing isn't the answer to the problem. The primary problem, therefore, is to get these eroded areas planted to grass and trees so that muddy silt laden water will not run off of these slopes, but instead clear water will "walk" into Norris Lake along its entire 950 miles of shore line. Little Caney Creek must be robbed of the shale it carries from steep corn lands; Hogskin and Crackerneck Creeks must be made to run clear. Erosion must be stopped in Kettle Hollow, Tater Hollow, Blue Mud Hollow,

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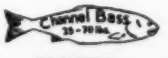
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On a trip I recently took up Clinch River, my guide and companion, an old saw mill operator, pointed out to me areas he had logged off twenty to thirty years ago. He recalled the large trees, chestnut, yellow poplar and oak he had cut from dense forests before the lands were cleared for corn and tobacco. He told me that before farming started there had been no erosion from even the steepest slopes and the streams ran clear and free from silt the year round. Now these same slopes are cut into ribbons by deep narrow gullies; bare, galled spots are everywhere present and, during severe storms, silt, gravel and even rocks are carried into the valley. Such areas present a challenge to those connected with the Tennessee Valley erosion control program. The challenge is being accepted and we feel that many of us will live to see the day when these same submarginal lands are again in timber and when the streams will again be free of mud and silt. This will have been accomplished as a result of the farsighted plan envisaged by President Roosevelt and made possible through the efforts and labor of the boys of the Civilian Conservation Corps.

THE LUMBER INDUSTRY EMBARKS UPON FORESTRY

(*Continued from page* 214)

tical way in accordance with conditions existing in the respective Divisions and Subdivisions shall secure application of the following principles:

(a) Fire protection during and immediately following logging is an indispensable condition for forest regrowth. Responsibility for adequate provisions for control of fires during or immediately following logging operations rests upon the individual operator if he is in any way the cause of such fires. Each operator shall be definitely responsible for taking practical measures of fire control. Such measures shall, to the extent necessary to provide adequate protection, include slash and snag disposal, rules as to use of fire by employees including smoking in the woods, equipment of logging locomotives and engines with adequate devices for preventing fires, having available upon call crews properly equipped to fight fires, closing operations during exceptionally dry periods, and other precautionary measures. Where a general fire protection system is in effect, each operator shall correlate his protection system with the general system, but such general system shall not replace the protection system of such operator, nor shall it relieve him of responsibility for protecting his own property to the extent that he has created the hazard. He shall not be considered to be responsible for fire caused by public carelessness or by inadequate public protection.

(b) To the end that protection against fire and other destructive forces may be rapidly extended to all forest areas that require protection, said agencies shall endeavor to secure action on the part of all operating forest land owners in the direction of cooperating with public organizations in systematic fire prevention and suppression and such protective action as may be practicable for protection against insects and diseases. Such agencies shall also seek to secure such cooperation on the part of non-operating forest land owners.

(c) As much as practicable of the advance growing stock upon the land in the form of young trees of valuable species below merchantable size shall be preserved during logging operations and left without injury for future growth. Each operator shall require his woods employees to exercise conscious care to reduce damage to advance growth to the minimum practicable.

(d) To secure natural reproduction, which will usually be obtained where partial cutting is practiced, there shall be left on the logged areas, where economic and other conditions permit, a sufficient number of trees of desirable species to yield a commercial cut at reasonable intervals. Under certain conditions, instead of partial cutting, the leaving of seed trees or groups of seed trees on or adjacent to logged areas may be sufficient to insure the required regrowth on the logged areas. If there is an insufficient reserve stand, or if conditions are otherwise adverse and the prospects of securing natural reseeding are uncertain, planting may be desirable.

(e) To the extent practicable, partial cutting or selective logging shall be the general standard for local measures of forest practice. Said agencies shall without delay, making use of existing information, undertake to determine by regions or by forest types, the extent to which merchantable sizes of trees may wisely be left as part of the forest growing stock. Upon satisfactory determination of such conditions said agencies shall promptly establish standards of practice looking to the attainment of this objective.

In certain regions or forest types, and under certain conditions which do not justify partial cutting or selective logging, other methods shall be allowed.

These rules of forest practice shall also apply to persons whose operations are in timber held under "lease" or "timber cutting rights" existing prior to the date of the President's approval of this Schedule, provided that due consideration shall be given to the ownership equities involved in order to avoid causing such persons unreasonable hardship by requiring the leaving of trees of merchantable sizes.

(f) In order to provide flexibility, each operator shall be encouraged to communicate to his agency the methods which he proposes as best suited in his individual operation to achieve the declared objectives of conservation and sustained production of forest resources, and if such proposed methods are determined by said agency to equal or excel the regional or type standard methods, they shall be approved in lieu thereof. This in effect permits modification of regional or type standards upon submission and approval of specific individual management plans.

(g) Said agencies shall, each within its own jurisdiction, investigate the feasibility of and shall actively encourage the application of sustained yield forest management wherever

feasible. Sustained yield forest management is defined as management of specific forest lands under single ownership or cooperative control within an economic unit, under definite management plan which limits timber cutting to the capacity of such forest lands under existing methods of management, as determined from existing growing stock and growth, to provide without interruption or substantial reduction raw material for industry and community support.

(h) Schedule C and the rules of forest practice and any other rules and regulations adopted pursuant thereto, being adopted in order to give effect in the public interest to the declared purposes of Article X may be enforced only by the United States through its appropriate enforcement agencies or officers. Nothing contained in this Schedule, or in the rules of forest practice or in any other rule or regulation adopted pursuant thereto, shall be construed to enlarge, increase, change or affect the legal duty, liability or responsibility of any person subject to the jurisdiction of this code to any other person, firm or corporation, whether or not the latter is subject to the jurisdiction of this Code, or to give to any such person, firm or corporation any right of action against any person subject to the jurisdiction of this code which would not have existed if this Schedule had not been adopted.

Amend Article VIII (k) by adding the following new paragraph at the end thereof.

"Pursuant to the foregoing each eligible person who makes application to be recognized as securing his raw material supply from forest lands under his ownership or control which are managed on a sustained yield basis, and who secures from his Division or Subdivision agency established or designated as provided in Section 1 of Schedule C a certificate showing that he is in good faith conducting his operation upon such basis, shall have his production allotments, as determined without the benefit of this paragraph, increased by 10 per cent. If only part of his raw material supply comes from such sustained yield operation, his increased allotment shall be that proportion of 10 per cent which the volume of his raw material coming from such sustained yield operation is of his total volume. Sustained yield forest management is defined in Section 2 (g) of Schedule C. The additional production allotments provided for in this paragraph shall come from the total national production quota."

WHERE THERE'S A WELL

(*Continued from page* 207)

nozzle is prevented from protruding beyond the leading rim of the casing. The latter is rotated by the wrench, and sinks into the ground as fast as the hole is created for it. While the casing is piercing the soil above the level of the water table more water is pumped into the ground than the soil can absorb; consequently a large portion of it returns in a flood to the surface of the ground carrying displaced soil with it, which builds up into a cone around the casing. After the rim of the casing passes the level of the water table most of the return flood over-flows the top of the casing and ceases to emerge at the ground line. During the sinking of the casing it is continually rotated by means of the casing wrench.

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and in final position for pumping. The casing is then withdrawn completely from the ground by means of a chain and pry. After its withdrawal the well-pipe remains in position and stands a foot or so above the ground ready to have the intake hose of the pump attached to it. As soon as the pump is coupled with the well pipe, the well is ready for operation.

It is apparent that the casing is not the well; the casing simply acts as a sheath which creates the well hole and holds it open until the screen is set in place. After it is withdrawn from the ground it has no further use as far as that particular well is concerned. The longest casing that is required for shallow wells is thirty feet in length. Usually eighteen or twenty foot casings are used, and the time required to wash one into the ground ordinarily does not exceed five minutes; the work has been done many times in three minutes by a well trained crew. The work of dropping the well screen in place, and withdrawing the casing requires an additional four or five minutes, and the well can then be put into operation at once. When clays or hardpans must be pierced, twice as much time may be required as when sandy soils are encountered.

The volume of water used in sinking a twenty foot casing averages 125 gallons; in favorable locations seventy-five to ninety gallons have sufficed. Pump pressures of forty to sixty pounds are ample for negotiating sandy soil, but in clays and hardpans pressures as high as 200 pounds are desirable. In heavy soils toothed casings and high pressures are indispensable. The yields obtainable from these wells depend chiefly upon the type of well screen used. With properly placed screens, discharges of forty to sixty gallons a minute are easy to obtain. Screens four feet in length, and three, or three and one-half inches in diameter are most useful. In many locations they can yield a hundred gallons a minute if pumps of that capacity can be obtained. Such wells have been operated for hours at a time with no decrease in yield.

During the fire season of 1933 well pumping with power-pumps was used in Michigan for the first time in actual fire suppression. A number of swamp fires, far from free water supplies, were mopped up and extinguished that could not have been put out in any other way. It is certain that in the future pumping equipment will be used throughout extensive woodland areas that heretofore have been considered "dry." A new use has been found for it and it can be put into operation in types of cover where no other class of machine equipment can be used.

There are a great many advantages to be derived from well pumping and they will bear summarizing:

Extensive and frequent use can be made of powerful pumping equipment; free water supplies are not absolutely essential.

Short hose lines can be used; wells can be sunk adjacent to desired points of attack.

There is scant necessity for operating hose lines in excess of 1,200 feet.

Wells can be established in relays. After the desirable maximum length of hose line has been laid out, the water from any one well can be used in sinking succeeding ones at the end of the hose lines. The pump can be moved to the new pumping site, and the attacks on the fire front continued. It is apparent that any one well guarantees a complete system of succeeding ones, to be established where and when needed. Entire fires can be encircled in this way if necessary.

Yields equal to the capacity of large pumps are easy to secure through the use of large well screens.

Fire-fighting in swamps, slash, and dense cover is now possible, where heretofore mechanical methods of suppression have not usually been feasible.

Back-fires can be set and held in hazardous locations under the protection of hose lines, and where plowed fire lines cannot be constructed.

At the present time the extent of country in which well pumping is possible is not known. The only limitations in its application are those of bed-rock and deep water tables. Any area where underground water can be reached within twenty-two feet of the ground surface is a pumping chance. All glacial country is characterized by high water tables, and it is certain that underground water supplies can be easily tapped over wide areas of the Lake States and eastern Canada. Much of the low-lying regions along the Atlantic and Gulf coasts and the lower Mississippi Valley exhibit high water tables.

A survey of underground water resources is now in progress in Michigan, under the direction of the state geologist, the sole purpose of which is to determine the extent and availability of ground water supplies for use in forest fire suppression. The data resulting from this survey will be issued to fire organizations in map form, which will show the depth of the water table throughout each fire district. By these means a fire crew will know beforehand whether or not a pumping chance exists at the location of any fire which is reported to them.

BABY STYLES IN BIRDLAND

(*Continued from page* 211)

in February or March, and many of the others are not far behind. Whatever the reason, the result is a step-ladder effect among the offspring, not entirely dissimilar to that frequently seen among larger human families. This is particularly noticeable in the accompanying photographs of a group of young marsh hawks and that of long-eared owls, the oldest of which is already showing some signs of developing wing quills.

While this group gets off to a somewhat slow start in the avian beauty contest, they keep their youthful attractiveness for a somewhat longer period, and long before their parents cease feeding them in the nest they have an attractively sleek appearance, fully feathered in their own appropriate pattern. The bewildered little screech owl in the picture, for example, had just taken his first flight from home. He landed in this tree in the early evening and was still there the next morning to stare with puzzled expression at two enthusiastic, but inexperienced nature photographers delighted to test their newly acquired art on a living subject.

Representing some of the in-between groups, the herons' babies are neither so beautiful as those previously mentioned, nor so homely as some of those to follow. They still retain the fuzzy covering, though it is neither so thick nor so soft as in the quail and ducks. Their bills are too big, their feet all out of proportion and continually in the way, and their necks too long and scrawny to win any beauty contest. Nevertheless they are quite attractive until they start to stretch, spreading the fuzz until each hair stands alone. Their lack of beauty at this time is at least partly compensated for by one of the oddest and most interesting feeding habits found in the bird world. Most other species feed their young by inserting the beak into that of the youngster. This is not the case with the herons and some heron-like birds. They will have none of such conventional behavior. When one of the parents returns to the nest, stuffed to the gullet

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Index to

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MAY, 1934

	PAGE
American Fork and Hoe Co.	233
American Pad and Textile Co.	234
American Telephone & Telegraph Company	2nd Cover
Atlas Powder Company	225
Austin-Western Road Machinery Company	219
Bartlett Manufacturing Company	232
Bass Camera Company, Inc.	238
Bausch & Lomb Optical Company	231
Binko Dude Ranch	228
Chalfonte-Haddon Hall	224
Cleveland Tractor Co., The	4th Cover
Colt's Patent Fire Arms Mfg. Co.	227
Disston & Sons, Inc., Henry	221
Dodson, Inc., Joseph H.	237
DuMaurier Company	235
East Michigan Tourist Association	228
Fechheimer Bros. Company, The	235
Franklin Forestry Company	232
Herbst Brothers, Inc.	225
Hudson Sporting Goods Company	227
Idaho School of Forestry	236
Keene Forestry Associates	232
Kelsey Nursery Service	232
Kelsey Nursery Service	231
Macmillan Company, The	234
Maine School of Forestry	237
Mayflower Hotel	237
Mears, A. H. G.	235
National Lumber Manufacturers' Association	223
New York State College of Forestry	236
Old Town Canoe Company	230
Pacific Marine Supply Co.	3rd Cover
Peat Import Corporation	229
Plumb, Inc., Fayette R.	226
Schoepfer, G.	238
Smith & Company, D. B.	222
Tabor, Rollin H.	238
Veterans of Foreign Wars	238
Victor Tool Company, The	238
Warren Axe & Tool Company	228
Western Maine Forest Nursery	232
Whall Camp Goods Co., Dick	230
Wisconsin Aquatic Nurseries	238
Woods, J. B.	222

with partially digested frogs, crawfish, or what-not, each youngster launches itself upward, using the long clumsy looking legs as a spring board. All keep jumping until one succeeds in seizing the mother's beak across the base, exactly as if its own baby beak were a pair of shears intended to sever completely the parent's bill. An indescribable series of contortions follow, for these babies are fed predigested food by a process of regurgitation. All through the contortions the youngster hangs tenaciously to the maternal beak to be finally rewarded by a ball of food which travels up the throat of the parent and out along the beak until it drops into that of the offspring. Occasionally this load is spilled, in which case the entire juvenile portion of the family engages in a wild if somewhat clumsy scramble after the scattered morsels. The resultant tug of war over frog-legs or crawfish-tails is an exciting and amusing event to an observer.

Among the so-called higher birds, beauty seldom comes until the feather covering is fully developed. Whether the youngsters are thrushes, sparrows, fly-catchers, or blackbirds, they are nearly naked, blind, and helpless, able only to raise their heads from a grotesque four-point support of wings and legs and beg for food with wide-open mouth. This group is known as altricial birds, or those hatched helpless and requiring the constant attention of parents for some time. These youngsters have one thing in common—an enormous appetite capable of seemingly endless development. The parents work long hours from daylight to dark carrying food to their begging offspring. With the smaller species this period of nest feeding extends for about two weeks, during which time the expression "free as the birds" becomes one of the world's great jokes. The parents are chained in helpless slavery by parental devotion.

From among this group whose newly hatched young are painfully alike in their near nakedness and helplessness, is produced a most astonishing array of color patterns as the plumage develops. It is the old fable of the ugly duckling unfolding again and again as these babies grow into the gorgeously colored small birds that add so greatly to our enjoyment of the out-of-doors.

While as a group the following rank far down the scale in ugliness, there are some worth mentioning because of exceptional accomplishment along this line. For example, the smooth sleek-looking mourning dove is everything a bird should *not* be, up to the last few days in the nest. It is hatched naked and helpless, and its quills develop like great blunted purple spines standing out from the body and giving the bird a hedge-hog-like appearance up to the very day the feathers burst the sheath and clothe the baby in appropriate dove color. Kingfishers and cuckoos go through a similar and even more pronounced metamorphosis in the last days of their nestling life.

When all is said and done, however, crows are the ugliest of young American perching birds. In addition to being naked the skin is blue-black of a peculiarly repulsive shade. When the quills start to grow they do not improve the appearance of the bird at all, for they impose a different blue-black on an already unlovely background. The raucous calls of the permanently hungry leathery youngsters completes the feeling of revulsion, and it is not until the feathers are well developed that anything particularly bird-like develops from these black leathery imps. Of all the young birds which I have seen, only cormorants and pelicans are uglier, and they would have a good chance of winning an ugliness contest anywhere in the world. Cormorants are reptilian in appearance and their offspring are undoubtedly the ugliest among American birds.

WHO'S WHO

Among the Authors in This Issue

Joseph Edgar Chamberlin

JOSEPH EDGAR CHAMBERLIN (*To Arms for the American Elm*) is a Boston journalist, long associated with the *Boston Transcript*, in which paper he has written a great deal about the trees and flowers of New England. He is a native of the Connecticut Valley, having been born at Newbury, Vermont.

BURT P. KIRKLAND (*A Forest Credit System*) is principal Forest Economist for the United States Forest Service, located in Washington, D. C. In 1908 he organized the Snoqualmie National Forest and remained its Supervisor for several years. Following that he was connected with the University of Washington, until 1931, where he was Professor of Forest Economics and Finance.

Gilbert Stewart

GILBERT STEWART (*Where There's a Well*) is Director of the Michigan Forest Fire Experiment Station at Roscommon. Born in Harrisburg, Pennsylvania, he received his B.S.F. from the University of Michigan and his M.F. from the Yale Forest School.

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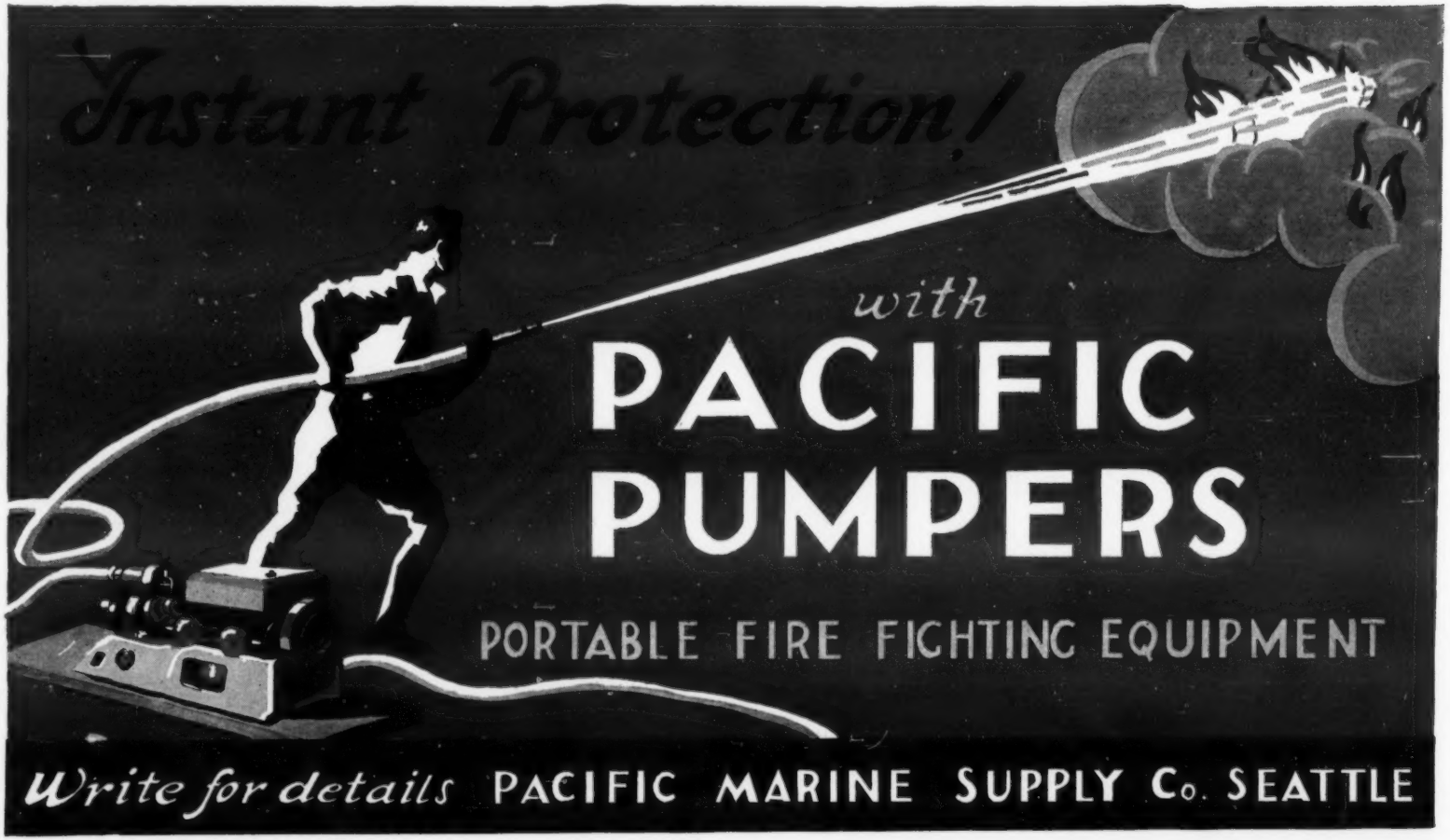
Ira N. Gabrielson

IRA N. GABRIELSON (*Baby Styles in Birdland*) is located in Portland, Oregon, where he is connected with the Bureau of Biological Survey, in its work of predatory animal and rodent control. He still finds the West as fascinating as he did when he was a boy living on a farm in Iowa.

MARY LOUISA HELLINGS (*Hepatica—My Gem of Peace*) is an author and culturist who lives in Titusville, New Jersey.

HAROLD BUCKLES ('*I Have Learned to Know the Human Race*'—"*What the C.C.C. Has Done for Me*") is enrolled in Company 857, Denison, Texas, where he edits and prints a camp paper, the "857 Log." Before he joined the Corps he worked in many capacities, including reporting, surveying, and selling.

JOHN HARVEY FURBAY (*Field and Forest for Boys and Girls*) is Director of Nature Education at the College of Emporia, Kansas.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